"THE BRITISH ORGAN AND ITS MUSIC DURING THE NINETEENTH CENTURY."

A study of the [illegible] development in the construction and use of the instrument, and its effect upon composition.

by

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1954 - 1957.

ST. GEORGE'S HALL, LIVERPOOL

This organ, opened by S.S.Wesley in 1855, was the first of Henry Willis' great masterpieces after his Exhibition organ. Both from the influence it had on organ-building in general (and Willis' career in particular), as well as for the transformation in organ-playing and composition brought about by its first organist, W.T.Best, who played it from 1855 to 1894, it can lay just claim to the title of "The Organ of the Century". The bust of W.T.Best may be seen, in white silhouette, in front of the console.

(Photograph by Gilbert Benham in Org.6.145)

P R E F A C E

It is a curious fact that, although the literature of the organ is a reasonably large one, no attempt has yet been made to study the history of the instrument in Britain in any detail. Hopkins and Rimbault covered a certain amount of ground up to 1800, but even they could not deal very extensively with the subject in a volume that was tracing the history of the organ not only in Britain but throughout Europe; and not only its history, but its construction also. For similar reasons Dr. Sumner, in his recent book, could paint little more than an outline picture.

However, the British organ's development prior to 1800 was one that does not admit of very discursive treatment. Progress was lamentably slow in comparison with that of Continental organs; and consequently the nineteenth century dawned with British organ-building literally hundreds of years behind that of France, Germany, Belgium and Holland. Yet, a century later, the position was redeemed and, even before our present era opened, the products of British organ-builders were not merely equal to, but, in general, superior to those of the Continent in tonal design, in mechanism, in artistic finish, and in ordinary maintenance and preservation.

The nineteenth century, then, must clearly be regarded as a remarkable, indeed glorious, period in British organ-building; in fact, one is tempted to enquire whether there exists, in the entire artistic and scientific history of any country, a similar example of accelerated development; in which one country has made up three hundred years' leeway in less than one-third of that time.

This thesis, therefore, sets out to examine and describe the events of the century, and the men who were responsible for those events; to trace the growth of the organ in its various departments; and, as the instrument itself is, after all, only a means to an end, to say something of the way in which it was used, the music which was played upon it, and the men who played and composed this music.

The thesis is divided into two volumes: the first deals entirely with the history of the instrument and its builders during the nineteenth century, with an introduction briefly recounting the story from the Restoration up to the year 1800; and the second volume is concerned with the music and the musicians, as well as the several detailed indices which are so necessary if a work of this kind is to be of any value at all.

A full Bibliography is given in Volume Two; but supreme acknowledgement must be paid here to the quarterly periodical, "The Organ" — still thriving after an active career that began in July 1921. Its scholarly articles range over the whole field of international organ-building and organ-history; and without its help this thesis would have been far less comprehensive in its scope and far less authoritative in its source-material.

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Acknowledgement is due to a number of people and organisations who have assisted materially in the preparation of this thesis; and the opportunity must be taken here of expressing sincere gratitude to them.

Professor Percival Kirby, formerly Head of the Music Department of the University of the Witwatersrand (Johannesburg), has been a never-failing source of advice and encouragement; his great experience of every kind of historical research, as well as his extensive library, have been invaluable assets.

A number of libraries have provided rare and out-of-print material, which has been made readily available under the admirable system of Inter-Library Loans. Above all, the Librarian and Assistant Librarian of Rhodes University, Grahamstown, and their staff, have always been most helpful; and the City Library of Port Elizabeth has enabled the writer to study what must be the finest collection of old organ-music in the country, if not in the whole Southern hemisphere — the Roger Ascham bequest.

Messrs. Novello and Company, the celebrated London publishers, have taken a great deal of trouble to supply and verify dates and other information about the innumerable composers whose organ-music they have published.

The British Museum authorities have been most prompt and

efficient in supplying a large number of microfilms of original music in their Music Library. The problem of research into a subject whose 'locale' lies six thousand miles away is vastly reduced by the photostat and microfilm; and by their aid the writer has been able to examine all the relevant surviving music relating to his subject. Moreover, this process of study has been, in some ways, easier than it would have been to work on the original scores in the Museum itself; for, thanks to a portable projector, it has been an easy and comfortable matter to read through this music actually at the organ (a facility that even the British Museum does not provide!) Visitor after visitor to the College Chapel where the present writer is organist has tiptoed away thoughtfully and sadly during the past eighteen months, shaking his head over the disturbing sight of an apparently mentally unbalanced organist sitting in complete darkness and providing an organ-accompaniment to some kind of magic-lantern show.

Mention has been made, in the Preface, of the inestimable value of the quarterly periodical 'The Organ' in providing material for this thesis. The first three of its thirty-five volumes have been quite unobtainable for many years past; but through the courtesy of the Rev. A. Pierce Jones of Cape Town (a well-known contributor to its pages), these all-important early volumes have been placed freely at the writer's disposal.

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INTRODUCTION — FROM THE RESTORATION TO 1800

Commonwealth and Protectorate

The history of organ-building in Britain is a long and honourable one, and can be traced back to the seventh century, when Theodorus (Archbishop of Canterbury from 669 to 690) provided his church with an
1) organ "before any other church in Western Europe". Nevertheless it is from the seventeenth century onwards that the organ, as we think of it, begins to take shape; and the musically lean years of the Commonwealth (lean, that is to say, as far as church music is concerned) provide an ideal starting-point for an introduction which aims to describe, in outline, the progress made in organ-building up to the time when our main account begins.

On January 4th, 1644, a Parliamentary Ordinance was passed, establishing a new form of divine worship in which no music was allowed but plain psalm-singing. (It must be understood that this refers to what we now call 'hymn-singing' — metrical versions of the psalms were the precursors of our modern hymns.) This was followed by another
2) Ordinance, dated May 9th, "for the speedy demolishing of all organs, images, and all matters of superstitious monuments in all Cathedralls, and Collegiate or Parish-Churches and Chapels. . . . . .the better to accomplish the blessed reformation so happily begun, and to remove all offences and things illegal in the worship of God." These two enactments were the final shots in a campaign that had been waged intermitt-

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1. Dr.Hook, "Lives of the Archbishops of Canterbury" Vol. I, p.199
2. Hopkins & Rimbault, 2nd edition, p.89

ently during the previous century, and in a very short time the state of affairs intended by Parliament had been brought about. Organs, monuments, vestments, stained glass, books and manuscripts throughout the land were destroyed amid scenes of violence and crude humour which have
1) been vividly described in a 1647 account that can be accepted as generally accurate, though its author is clearly no supporter of the Puritan cause. What is remarkable is that any organs escaped at all: yet in fact there were several important instruments that survived, and possibly many more of lesser repute. Those of St.Paul's, York, Durham and Lincoln Cathedrals, St.John's and Magdalen at Oxford and Christ's College, Cambridge, were spared, as well as the glorious casework, at least, in King's College, Cambridge.

In all fairness to Cromwell, it should be realised that he was by no means opposed to organs in themselves — it was their use in worship to which objection was taken so drastically. Magdalen's organ, indeed, owed its escape to the fact that it was requisitioned by the great man himself about 1654 and installed in Hampton Court. Moreover, much of the damage (and the uncouth way in which it was done) was due to rowdyism rather than religious zeal, and decreased sharply after the
2) well-disciplined New Model Army was able to make itself felt in 1645.

The Restoration and after

Despite the fact that a few organs remained in use here and there, in private houses or taverns, organ-builders had to go out of

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1. Mercurius Rusticus: "The Country's Complaint recounting the sad events of this Unparralold Warr."
2. P.A.Scholes, "The Puritans and Music"

business and most of them were compelled to work as joiners and carpenters; at least two took refuge abroad, to the lasting benefit of post-Restoration organ-building. By 1660, the only men capable of an immediate resumption were the brothers Dallam, Thamar of Peterborough, Preston of York and Loosemore of Exeter. The problem of post-war shortages of man-power in industry is a familiar one to us of the twentieth century; and it was dealt with in the seventeenth in the right and obvious way, by a policy of immigration with inducements (a solution which does not always seem to occur to similarly-situated governments of our own day.)

1) Burney tells us: "After the suppression of Cathedral Service and prohibition of the Liturgy, some of the ecclesiastical instruments had been sold to private persons, and others but partially destroyed; these being produced, were hastily repaired, and erected for present use. A sufficient number of workmen for the immediate supply of cathedrals and parish churches with organs, not being found in our own country, it was thought expedient to invite foreign builders of known abilities to settle among us; and the premiums offered on this occasion brought over the two celebrated workmen, Smith and Harris."

There is no other evidence about these premiums, as to their amount and by whom they were offered; but the results were far-reaching in their influence on organs in Britain. The local craftsmen were naturally eager to resume their activities, but they were inevitably out-

1. Burney, "History of Music", Vol.III,p.255

of-practice and out-of-date: and the time had come for Britain, by importing fresh blood and new techniques, to begin emerging from the stagnation into which organ-design had been declining for generations past. The two men referred to by Burney had learned their trade in Germany and France, countries which were about three centuries ahead of Britain as far as organs were concerned, and they were not long in obtaining a virtual monopoly between them, remaining business rivals for nearly half-a-century.

Father Smith — as Bernhard Schmidt became known — was at first the more successful of the two, until after the deaths of Robert and Ralph Dallam in 1665 and 1672 respectively, and of the elder Harris shortly after this. Henceforward, until Smith's death in 1708, his only competitor was the younger Harris, Renatus.

Smith began work in 1662, if not before, and by 1681 he had been appointed the King's Organ Maker, though he had been doing, or
1) helping to do, his predecessor's work for nearly twenty years. From 1685 until 1687 he was engaged in the "Battle of the Organs" with Harris at the Temple Church, from which he emerged victorious with an instrument whose important innovations are discussed below. Another of his masterpieces was at St.Paul's Cathedral in 1697, and was a famous example of the eternal conflict between organ-builder and architect (Sir Christopher Wren, in this instance) over the dimensions of the organ-case; Here also, Smith was the victor. Another of his largest organs was the second of his two at Trinity College, Cambridge, on which he was engaged at the

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1. Freeman, "Father Smith", p.3

time of his death in 1708; it was completed by his foreman, son-in-law and successor, Christopher Schrider.

Smith's work was characterised by fine and durable workmanship, as far as the tone-producing side of the organ was concerned — in his mechanism and action he was far inferior to his rival, as we are assured
1) by both Sir John Hawkins, who condemns his mechanical workmanship but
2) describes his tone as unequalled in fineness, and Sir John Sutton, who tells us that the touch felt as though cotton-wool was placed under each key, and that the irregularity of the wind-supply caused the organ to sound tremulous. On the other hand, when the Temple Church organ was about to be rebuilt by Mr. F.Rothwell in 1910, he reported that the
3) Smith pipes contained at least 90% tin, that they were well put together and still quite strong, showing no trace of corrosion or decay; the oak of the wood pipes was nowhere worm-eaten or rotten, and was as good as new, as also was the glueing. This was two and a quarter centuries after the erection of the organ !

Smith undoubtedly set new standards of ensemble for other builders to aim at; the Father Smith organ became an ideal, a tradition. When one has heard, and played on, some of the few remaining examples of his pipework, there is no need to seek further for an explanation.

The Harrises were an English family who had lived and worked in France during the Commonwealth. John Harris' father had built the Magdalen organ in 1637 (the selfsame instrument which Cromwell had 'borrowed'), and now John returned with his son Renatus to enter into

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1. Hawkins, "History of Music" Vol.IV,p.355
2. Sutton, "A short account of organs" (1847), pp.27-9
3. Macrory, "Notes on the Temple Organ" 3rd edn, 1911

the protracted and, on the Harris side, bitter competition with Smith — competition for contracts, for Court patronage, and even for the dubious distinction of being the first to subdivide notes into fifty and a hundred parts.[1] Renatus outlived Smith by sixteen years (he died in 1724), and his principal successes were in the field of mechanical development and action. Pipework by Smith is still encountered, preserved, treasured and often specially indicated on the console in a number of organs up and down Britain; the same cannot be said of Renatus Harris, great man though he was.

Early post-Restoration organs

Before the Commonwealth, the average organ in Britain consisted of between ten and fourteen stops shared between two manuals, the Great and the Chair (for a discussion of this term, see Chapter One). Since the beginning of the century, there had been little or no sign of progress; for instance, the organ installed in Worcester Cathedral in 1613 by Thomas Dallam has a specification which closely resembles that by the eldest Harris at Magdalen in 1637 and by Taunton at Wells Cathedral in 1662. There is certainly not the evolution that one would expect in a flourishing craft over a period of fifty years. Examination of organs built at successive half-century intervals subsequently will emphasise the poverty of the post-Restoration situation.

The specifications of 1613, 1637 and 1662 are given on the next page. Thomas Dallam, incidentally, is unique among organ-builders in having been "starred" as hero of a BBC dramatic production, in which the story of his famous mechanical organ, Queen Elizabeth's gift to the Sultan of Turkey, was amusingly related.

1. "The Post Boy", April 30th, 1698, advert. (quoted by W.L.Sumner, "The Organ" p. 145)

1) <u>Worcester Cathedral — Thomas Dallam, 1613</u>

Great organ	Chaire organ
Open diapason	Diapason (wood)
Open diapason	Principal
Principal	Flute
Principal	Small principal or fifteenth
Twelfth	Twenty-second
Small principal or fifteenth	
Small principal or fifteenth	
Recorder	

2) <u>Magdalen College, Oxford — "Grandfather" Harris, 1637</u>

(sold to Tewkesbury Abbey in 1737)

Great organ	Chair organ
Open diapason	Stopped diapason
Open diapason	Principal
Principal	Principal
Principal	Recorder
Fifteenth	Fifteenth
Fifteenth	
Twenty-second	
Twenty-second	

3) <u>Wells Cathedral — Robert Taunton, 1662</u>

Great organ	Chaire organ
Open diapason	Stopped diapason
Open diapason	Flute
Stopped diapason	Principal
Principal	Fifteenth
Principal	Fifteenth (wood)
Twelfth	Twenty-second
Recorder	
Twenty-second	

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1. Document on Worcester Library (quoted by Freeman in Org.5.66)
2. Grove, II.589 (2nd edition)
3. Document in Wells Cathedral Library (quoted by Sumner, op.cit., p.123)

Sixteen years' enforced inactivity, however, combined with the new influences which were at work, resulted in rapid strides being taken from the very moment that organs were once more 'legal tender'. For example, in the new organ built by Ralph Dallam at St.George's Chapel, Windsor, within a few months of the Restoration, we find compound stops appearing for the first time, in the shape of a divided stop of three ranks ('Cornet, treble' and 'Sesquialtera, base'). The trumpet on this organ is the first example of a reed stop in Britain, and it too was divided halfway up its compass, each portion of the stop being controlled by a separate drawknob. Yet a third novelty was introduced by Dallam, namely "Shifting movements". These were the precursors of what we now call composition pedals: there were two, the one reducing to diapasons and principal, the other to diapasons alone. The cornet was to become a most popular solo stop for the next 150 years, equivalent to our modern tuba — though it was not a reed stop, but a brightly-voiced compound flue stop of 3, 4 or 5 ranks.

Not every builder adopted these innovations at once, but in 1664 at Wimborne Minster Robert Hayward used compound stops of 4 and 5 ranks, a trumpet and, in addition, mutation stops — tierce (17th) and larigot (19th), thus supplying the next two harmonics above the customary 'fifteenth' as independent stops. These developments in an upward direction were closely followed by one at the opposite end of the scale. At Exeter in 1665, Loosemore used large bass pipes extending down to a speaking length of 20 feet 6 inches (total overall length 24 feet 6 inches) sounding GGG at the old high pitch. These pipes, of which there were fourteen, were of course not pedal pipes, but were manual subunisons;

the usual compass on the manuals began at GG (10 2/3ft), i.e. five notes below the CC which has become universal since the middle of the nineteenth century.

The Harrises, father and son, in their early post-Restoration work show that John, at anyrate, has learned little from his sojourn in France, as Dallam most certainly had (for although there is no evidence either for or against Ralph's having accompanied his Brother Robert when he lived in Brittany from 1642 until 1660, he may well have done so: or, if not, he would very possibly have kept in touch; there can be no other explanation for the remarkable organ at Windsor.) It is not until 1670, at St.Sepulchre's, Holborn, that Renatus' influence seems to be in the ascendant. This was the first Harris organ in London, and its eighteen stops included three compound stops, mutations and four reeds: trumpet and clarion on the Great, vox humana and cremona on the Choir. From this date onwards, although the elder Harris lived until 1683 or 1684, Renatus seems to have been responsible for all organs bearing the name of Harris.

Father Smith was now beginning to make his contributions to this renaissance of organ-building. His celebrated Temple organ (first erected in 1683, finally accepted in 1687) contained a <u>third manual</u>, called "Echos" and comprising two complete stops and five of half compass; and there were two extra keys, called "quarter-notes", in each octave. These were an attempt to overcome some of the shortcomings of unequal temperament tuning; G sharp was provided separately from A flat, and similarly D sharp from E flat. The organ consisted of twenty-three stops altogether, with trumpets on the Great and Echo, the ubiquitous "voice humaine" on the Choir (let us hope that Father Smith's English was better than his French) and a string-toned stop "violl and violin".

In his organ at St.Paul's Cathedral, erected between 1695 and 1697, Smith again had three manuals; but whereas the Temple organ had two full-compass stops on the Echo, here all the stops were of half compass only. There were 27 stops (Great 12, "Chayre" 9, "Echoes or halfe stops" 6), and the compass of the Great went down to 16ft CCC, much to the annoyance of Wren, who had designed his case for 12ft pipes — not unreasonably, since the contract specified a GG compass. Four reeds and five compound stops were included; and here it is curious to note that Harris, despite his progressive scheme at St.Sepulchre's in 1670, was apparently reluctant to use reeds very extensively, or to adopt the third manual. Not until about 1700, at St.John's Chapel, Bedford Row, did he seem to spread his wings; such of his organs as are known to us during the intervening years are mainly small two-manuals without reeds.

Eighteenth century developments

Smith lived for only eight years of the new century; but Harris was now to produce some of his finest work, and new figures were about to appear on the scene. Harris, during his remaining 24 years, began to show his genius on the mechanical side. The device which we now call "duplexing" or "borrowing" was introduced by him under the name of "communication", i.e. the making available on one manual of stops from another. He had made use of this in his rejected Temple Church organ, and in 1700

1) at Bedford Row he made four of the Great stops separately playable on the Choir; and there were other novel features on this large three-manual of 27 stops and 4 "by communication". The Great had a "Sesquialtera bass" of three separately-drawn reed mutation ranks, up to middle B; and on the Echo, the four ranks of the cornet were also individually 2) available — "an arrangement" says Dr.Hopkins austerely "evidently adopted rather for ostentation, as these sets of little pipes could scarcely have been required separately for any useful purpose." [illegible]

Harris carried his ingenuity further still at Salisbury Cathedral in 1710, with the first four-manual organ, containing 46 stops, of which 13 were borrowed from the Great and made playable on the additional manual, called the "Second Great", and two were spare knobs. There was also a "drum pedal" — two pipes tuned slightly off-unison to beat on CC: an unpleasant contraption which, in the guise of a "thunder pedal", lasted well into the nineteenth century.

The year 1712 saw the first appearance of the swell, in a four-manual organ built by Abraham Jordan and his son at the church of St.Magnus, London Bridge. The fourth manual here was a counterpart of the third (Echo), with the difference that one side of the wooden box, in which Echo-organs were usually enclosed, was made to slide up in response to a pedal, after the manner of a sash window: careful control of the pedal was necessary to prevent the box from closing with an unwanted bang. There is, unfortunately, no record of the contents of this

1. II. Grove 2. 595.
2. ibid.

organ: the fourth manual had disappeared by 1795. We know of this invention from an advertisement in 'The Spectator' of February 12th 1712, in which Messrs Jordan announce that one of the four sets of keys is "adapted to the art of emitting sounds by swelling the notes, which never was in any organ before......"

In this same year, Harris issued a pamphlet setting out his proposed scheme for a new organ in St.Paul's Cathedral. In the course of this document, he claims to have introduced a swell into his Salisbury organ in 1710; and as far as one can gather from a study of this pamphlet, Harris' system did not involve a swell-box, but made use of multiple ranks of unison pipes, presumably controlled by some sliding contrivance which added or subtracted the ranks in succession, not unlike the "general crescendo pedal" of to-day. However, there is no record which can verify Harris' claim, so that the honours remain with the Jordans. Harris' proposals for St.Paul's are worth noting, even though they never came to fruition, as shewing what he would have liked to instal in a great church like St.Paul's: both he and Smith were obviously restricted by the conservatism of British organists. He specified six manuals (of which the fifth alone was to contain more stops than any other organ in England at that time) and an independant Pedal-organ, as "us'd in all the great Organs beyond the Seas."

Harris greatly increased the proportion of reeds in his organs after the beginning of the new century: at Salisbury he had eight reeds out of thirty-one actual speaking-stops (excluding the borrowed ranks) and in his last organ at King's Lynn in 1724 there were no less than twelve reeds out of twenty-nine stops.

Mention of the conservatism of British organists in their reluctance to welcome the pedal-organ, prompts the reflection that a similar charge can be levelled at German organists for their refusal to make use of the swell principle for a very long time after its genesis in England.

Richard Bridge, who is thought to have been a pupil of John Harris, was an important figure in organ-building between 1730 and 1760; in the former year he erected an organ at Christ Church, Spitalfields, which with thirty-three actual stops was the largest in England at that date — and one-third of these stops were reeds.

Renatus Harris had a son, John, who formed a very effective partnership with John Byfield (Renatus' son-in-law) between c.1725 and c.1742. They were extensively occupied in converting Echo organs into Swells, on the "Nag's head" pattern — as Jordan's invention was called — by making the front of the echo-box movable. Later the "grid-iron" type of swell was found to be an improvement; this consisted of two frames of horizontal slats alternated with spaces, the back one fixed and the front one controlled by a pedal, so that the box could be open or shut according to whether the spaces corresponded or not. In fact, so much of this swell-adaption did Harris and Byfield do that Burney, writing in 1803, thought that the swell was actually their invention. 1)

The very first organ built by the partners was remarkable in several respects. St.Mary Redcliffe, Bristol, in 1726, had a compass

1. Letter to Dr.Calcott, quoted in Org.25.114.

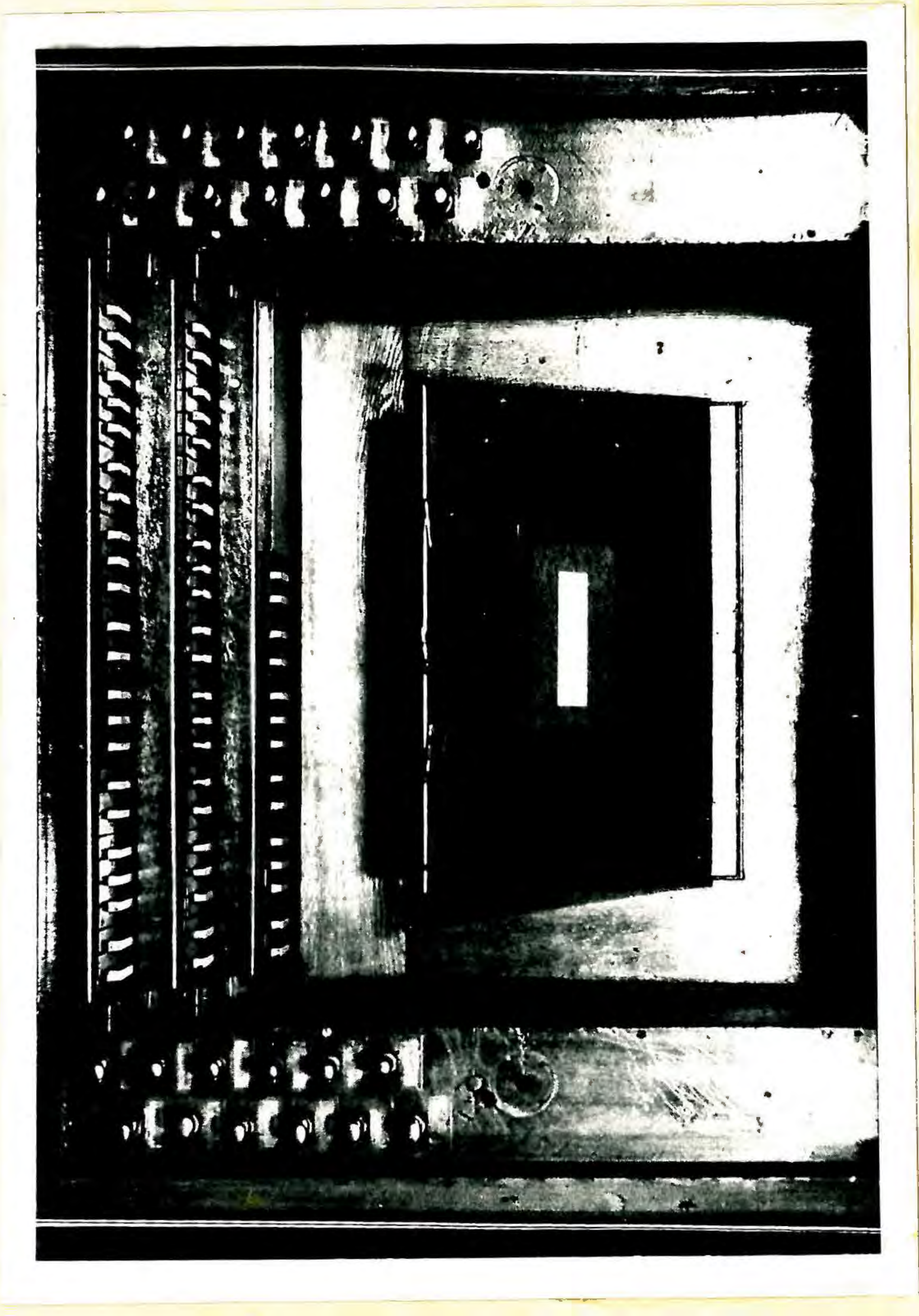

PLATE I.

A late eighteenth-century console.

This is the console of Snetzler's organ in Rotherham Parish Church, opened in 1777. The organ consisted of ten stops on the Great, six on the Swell and four on the Choir. The "fiddle G" compass of the Swell and the "GG long octaves" of Great and Choir can be seen, as well as the then customary reversed colours of the naturals and sharps.

(Photograph from Org.7.21, by J.C.Cox)

of 63 notes on the Great, from 16ft GGG; the Swell was unusually large with nine stops; there was an octave of pedal "pull-downs" acting on the lowest octave of the Great, undoubtedly the earliest known pedals in any British organ; and there was what the builders' original description

1) announced as "an Invention which by drawing only a stop, makes it almost as loud again as it was before (or play in a double Manner) though there are no new pipes added to the Organ, or any keys put down by it."

This is not exactly crystal-clear, but Dr.Hopkins is supported by the Bristol organ-builder Vowles, who had a great deal to do with this organ a century or so after its erection, in his belief that this "Invention" was the first octave coupler, originally known as a "spring of communication", acting on the Great organ. The 26 stops of this organ, on three manuals, included 8 reeds.

John Snetzler is another builder whose work is treasured today in a number of organs throughout the kingdom. Between 1748 and 1781 he was completely or partially responsible for at least 80 organs, and possibly many more of which we know not. What little we know of the man himself comes from Burney, who thought highly of him, and recommended him for the building of the new organ at St.Margaret's, King's Lynn in 1754; and it was this organ which contributed largely to the establishment of Snetzler's reputation. It was the first organ to have a full-compass manual double (a metal bourdon) and a "dulciana" stop. This, as a matter of fact, was not the stop which we now know by this name,

1. Freeman, "John Harris and the Byfields", Org.25.116.

but was a 'dolcan', with pipes of inverted conical shape, such as had been common in Germany for the previous hundred years. On the Great, Snetzler placed a nine-rank mounted cornet (as usual, from middle C upwards only), which was the largest compound stop up to that date: its ranks were 1,5,8,10,12,15,17,19,22. Snetzler, too, was a contributor to the tardy and belated progress of the pedal department in Britain; this is discussed later under its own heading.

After 1750, the name of George England appears frequently, up to 1784. The swell was beginning to become more popular, and a two-manual organ nearly always had a swell as its second manual in place of the choir. The five-rank mounted cornet was an invariable feature, with several other chorus mutation ranks. This was the great period of "cornet voluntaries". After 1779, England was partnered by Hugh Russell for about ten years. This Russell and his son Timothy will be referred to again later, as they were at work well into the nineteenth century.

Another whose work began in the eighteenth century (1788, to be precise) and continued into the next, was George's son, George Pike England. Among the representative specifications given at the end of this chapter will be found one of his organs built in 1796, as an example of an extensive reconstruction at the close of the century.

Samuel Green was a man whose great reputation in his own day has not endured. Freeman sums him up aptly: "There has never been any

question as to the all-round excellence of his work, but it is

1. Freeman, "Samuel Green, Organ builder to King George III", Org.23.110.

clear that he had no sooner started on his own account than he broke away from some of the fundamental traditions of his craft. In doing this he wandered off along paths that are now seen to be blind alleys. At the time they were rather captivating, and they won for him the royal patronage. And if the various organists should be held responsible for the choice of Green to build the organs on which they played, we may add that these byways were alluring enough to warp the judgement of some of the best musicians of the period. Such of his instruments that remain till the present day can still charm though they no longer tempt. Sweetness of tone became an obsession with this most capable builder and his patrons, and English organ building was at a standstill till Green's (and George III's) ideals had been rooted out."

Despite the competition of other fine builders, who have been referred to above, Green soon found himself at the top of his profession, after his first big success at St.Katharine's-by-the-Tower in 1778 (three manuals, twenty-one stops) with its unprecedented Swell compass of forty-six notes from gamut G upwards. He built or rebuilt over sixty organs, including those in seven cathedrals, and became royal organ-builder after Snetzler's death. He died a poor man, owing partly to excessive zeal in experimenting towards mechanical improvements, and partly to immense time and trouble in perfecting the tone of his instruments. 1)

His mechanical experiments may have produced minor adjustments and improvements, of which we know nothing; the only notable inventions

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1. Letter in "The Gentleman's Magazine", April 30th 1814, quoted in Org.23.111.

which are often attributed to him are two (and even these attributions must be qualified): horizontal bellows, in place of the diagonal type which was as old as the organ itself, and Venetian swell-shutters in place of the "Nag's head" or "gridiron". However, a clockmaker by
1) name Alexander Cumming wrote about horizontal bellows in 1762, and installed one in an organ built under his direction in 1787 for the Earl of Bute, the very year in which Green first used this type of bellows at St.Thomas', Ardwick, Manchester; and in any case Green continued to prefer the diagonal bellows for his larger organs and to use the horizontal in chamber instruments. As for the Venetian swell-shutters, Green did little more than to adapt the principle already common in harpsichords.

2) However, Green certainly did increase the size and importance of the Swell organ, both in stops and in compass. Most previous Echoes and Swells went down to middle C, or occasionally to fiddle G. Green took fiddle G as his minimum compass, and often went a tone lower (to tenor F) and sometimes to tenor C, gamut G and even FF — the latter at Greenwich Hospital in 1789. His organ at St.George's Chapel, Windsor, was totally enclosed in a general swell; the compass of the Swell keyboard went down to tenor F, and the Great and Choir two octaves lower, to FFF (12ft). This experiment, though, was not a success; Green's delicately-voiced pipework was inadequate for total enclosure, and the general swell-box was removed in 1836.

Green was the first builder to make frequent use of the 'white'

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1. Hopkins and Rimbault (2nd edn), p.14
2. Freeman, "Samuel Green", Org.23.113-4.

keyboards (Snetzler had used them occasionally, in chamber-organs only); and he greatly popularised the newly-introduced Snetzler dulciana, though in a form which was nearer to the stop as we know it to-day. He used much thinner metal than other builders, because it suited his delicate
1) style of voicing; what Hopkins calls his "light, playful and musical tones". Green's work was widely acclaimed during his lifetime, but Sir John Sutton in 1847 was not so enthusiastic, criticising him for lack of fullness and brilliance, all his organs being large chamber-organs
2) — "a style of organ-building which had many imitators, and from which the trade is only just recovering".

Green seems to have been the pioneer of the detached console, although Byfield is said to have been earlier in the field, with a "long movement" at Vauxhall Gardens in about 1730; details regarding this, however, are obscure. Green designed an organ for Canterbury Cathedral in 1784 which was, earlier in the same year, used for the Handel Commemoration Festival in Westminster Abbey; the console was placed about twenty feet below the pipework, connected to it by the mechanism which gave the name of "long movement" to what we now term a detached console. Incidentally, the term 'console' was not used in this meaning until nearly a century later: the word 'keyboards' or 'sets of keys' served in the meantime.

As the reader will have gathered, sheer size was not one of Green's objectives; his two biggest instruments contained no more than 24 stops. The specification of one of these, St.George's, Windsor (1790) is given at the end of this chapter.

1. Hopkins and Rimbault, p.301
2. Sutton, op.cit.,

John Avery was a builder whose work began in 1775; and he will receive more detailed mention later, as his activities went on until at least 1808. However, as his name is often brought up in connection with the origins of the pedal organ, à propos of his Westminster Abbey rebuild, it seems appropriate here to review the progress of this all-important department of the instrument up to the time at which our main account begins.

The pedal organ up to the end of the eighteenth century

The authorities are far from being in agreement on the origins of the pedal department in Britain; but none of them attempt to deny that we were about three centuries behind the Continental countries in this respect. Forkel's scathing remarks show clearly enough what were the views of German, and doubtless French, musicians on organs without pedals. "The Pedal" he says, "is an essential part of the organ: by this alone it is exalted above all other instruments; for its magnificence, grandeur, and majesty depend upon it. Without the Pedal, this great instrument is no longer great: it approaches those little organs called in Germany 'Positivs', which are of no value in the eyes of competent judges." 1)

The table given at the end of this chapter will illustrate how far ahead the Continent was; never have the disadvantages of insularity — in all senses of the word — been more powerfully demonstrated than in this branch of organ-building.

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1. Forkel, "Life of Bach", p.99

It has often caused wonder that Bernard Smith and Renatus Harris, brought up as they were among the large instruments of Continental Europe, did not have more influence in remedying this sad deficiency. But the dour conservatism of British organists has shown itself
1) again and again. As Hopkins wisely remarks: "Nearly every other real improvement in the organ has met with the greatest opposition — as the introduction of doubles, the establishment of equal temperament, the restoration of the CC compass, etc — and probably the idea of introducing pedals met with no better reception."

The long manual compass, half-an-octave lower than we now have, gave organists the idea that they were producing a satisfactory effect by playing the bass part down in the depths, and the rest of the harmony with the right hand about two octaves higher. Thomas Casson, to whom as much as anyone else we owe our modern pedal department, once said
2) "The older organists stoutly affirmed that a musician could do everything that was wanted with his hands, and that they were not going to be turned into dancing-masters."

Until recently, it was generally held that no British organ had pedals until 1790, at the earliest. This belief was due to Hopkins, whose monumental joint treatise with Rimbault, and whose articles in Grove's "Dictionary", were accepted for want of alternative theories. What has clouded the issue has been the way in which the word "Pedals" has been used indiscriminately to denote the actual pipework as well as the keys which caused these pipes to speak. Hopkins offered three

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1. Hopkins and Rimbault, p.227
2. Casson, "The Pedal Organ; its History, Design and Control".

claimants to pedal-priority: Westminster Abbey, the German Lutheran Church in the Savoy, and St.Matthew's Church, Friday Street; but he gives his own final verdict in favour of yet a fourth — St.James', Clerkenwell, built by G.P.England in 1790.

At Westminster Abbey, John Avery is said to have installed an octave of open pedal-pipes (from GG, 10 2/3ft), for which Dr. Cooke composed his Service in G. However, this service was composed in 1778, and if the pedal pipes were in position by then, they must have been
1) the work of Thomas Knight: Avery's connection with the Abbey did not begin until 1790.

Snetzler's Savoy organ (1757) certainly had pedals of a sort — nineteen of them — though they were of the "pull-down" type, without
2) separate pipes; and another of his organs, built at Sculthorpe, Norfolk, in 1756 had a few of these also.

However, more recent researches have established that, belated though the arrivals of pedals was, their first appearance was at any rate much earlier in the eighteenth century than Hopkins would have us
3) believe. There is an entry in a Wages Book at St.Paul's Cathedral to the effect that Christopher Schrider (Smith's son-in-law and successor) added, among other repairs in 1720-1, "Six large trumpet pipes down to the 16 foot tone, to be used with a pedal or without"....... and again: "the pedal and its movements"....

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1. Org.2.138

2. Pearce, "The Evolution of the Pedal Organ"

3. Sumner, "The Organs of St.Paul's Cathedral", p.16

1) Another significant reference comes from Burney. "On Handel's first arrival in England, from Green's (sic) great admiration of this master's style of playing, he had literally condescended to become his bellows blower, when he went to St.Paul's to play on that organ, for the exercise it afforded him, in the use of the pedals". Now Handel first came to England in 1710, finally settling in 1712: and Greene was organist of St. Paul's from 1718 to 1755. Moreover, two of Handel's concertos, published in 1740 and 1760, included a pedal part.

2) Again, two works of reference, dated 1740 and 1767, give the impression that pedals and pedalling were familiar; and going back further still, the famous Harris and Byfield organ at St.Mary Redcliffe, Bristol (1726), had an octave of pedals, without pipes.

Thus at the turn of the century it may be said that a limited range of toe-pedal "pull-downs" was not quite unknown, at least in a few larger organs — sufficient for the bass parts of psalm-tunes and for pedal-points in voluntaries. As for independent pedal-pipes, the situat-
3) ion is made clear by Henry Leffler, a London organist whose notebooks give us invaluable information on practically every organ of note throughout Britain between 1800 and 1810. Out of 33 cathedrals and collegiate churches at that time, only 9 had any pedals at all, and of these only two had pedal-pipes: Westminster and Hereford. We shall see in the next chapter that Hereford was furnished with pedals by Elliott in 1806; thus Westminster remains in sole possession of the field, as the only organ with pedal-pipes at the dawn of the nineteenth century.

1. Burney, "Account of the Handel Commemoration of 1784", p.33n.
2. Grassineau, "Musical Dictionary"(London 1740) and Tans'ur, "Elements of Music Displayed"(London 1767)
3. Re-edited as "Notes on English Organs" by C.W.Pearce in 1911.

TABLE OF IMPORTANT CONTINENTAL ORGANS

(up to the end of the eighteenth century)

These are selected from the large number of descriptions and specifications given in Hopkins and Rimbault (2nd edition). The table illustrates for how long a period, and over how wide an area of Europe, large and well-balanced organs had been prevalent. England had a long way to go to reach equality: but by the end of the nineteenth century this had been more than achieved.

	Date	Place	Manuals	Total stops	Pedal stops	32 ft stops
	1429	Amiens Cathedral	3	40	7	
	1520	Constance Cathedral	2	27	8	
	Pre-1548	Hamburg, St.Peter	3	50	13	2
	1651	Lucerne Cathedral	3	48	13	1
	1683-6	Amsterdam, Old Church	3	51	10	
	1686	Hamburg, St.Nicolas	4	67	16	2
	Late 17th cent:	Hamburg, St.Jacobi	4	60	14	2
	1703	Goerlitz, SS.Peter and Paul	3	55	19	1
1)	Early 18th cent:	Lubeck, St.Mary	3	52	15	2
	1716	Strasbourg Cathedral	3	42	7	
	1725	Berlin, Garrison Church	3	49	12	1
	1726-30	Waltershausen	3	50	14	1
	1735-8	Haarlem, St.Bavon	3	60	15	2
	1736	Gouda, St.Jan	3	51	11	
	1754	Dresden, Royal Catholic Ch.	3	48	8	1
	1766	Nijmegen, St.Stephen	3	53	12	
	1768	Hamburg, St.Michael	3	70	16	3
	1781	Paris, Ste.Sulpice	5	64	11	1

N.B. These are not isolated examples, but are chosen to show that organs of large size were not restricted to one area or one period. It would be easy to quote scores of other organs, but the above table will be sufficient to impress on the reader the comparatively lowly position of British organ-building at the beginning of our account.

1. This was Buxtehude's instrument, which Bach travelled two hundred miles to hear.

SPECIFICATIONS

(to illustrate Introductory Chapter)

1. TEMPLE CHURCH, LONDON — Father Smith, 1683-7

Great Organ

Prestand	61	pipes	12 foote Tone
Holflute of mettle	61	"	12 foote "
Principall of wood and mettle	61	"	06 foote "
Quinta of mettle	61	"	04 foote "
Super octave	61	"	03 foote "
Cornett of mettle	112	"	02 foote "
Sesquialtera of mettle	183	"	03 foote "
Gedackt of wainescott	61	"	06 foote "
Mixture of mettle	226	"	03 foote "
Trumpett of mettle	61	"	12 foote "

Chair Organ

Gedackt wainescott	61	"	12 foote "
Holflute of mettle	61	"	06 foote "
A Sadt of mettle	61	"	06 foote "
Spitts flute of mettle	61	"	03 foote "
A Violl and Violin of mettle	61	"	12 foote "
Voice humane of mettle	61	"	12 foote "

Ecchos

Gedackt of wood	61	"	06 foote "
Sup. Octavo of mettle	61	"	03 foote "
Gedackt of mettle	29	"	
Flute of mettle	29	"	
Cornett of mettle	87	"	
Sesquialtera	105	"	
Trumpett	29	"	

Compass of all three manuals: FFF (no FFFsharp or GGsharp) to C, 54 notes. Above gamut G, the 'quarter-notes' provided an extra two notes to each octave.

(This is the original specification, as given in the deed of sale, dated June 20th, 1688, and quoted by Freeman in "Father Smith", p.25)

2. SALISBURY CATHEDRAL — Renatus Harris, 1710

Great(15 stops)

Open diapason
Open diapason
Stopped diapason
Principal
Flute
Twelfth
Fifteenth
Tierce
Larigot
Sesquialtera, IV ranks
Cornet, V ranks
Trumpet
Clarion
Cremhorn
Vox humana

2nd Great(13 borrowed stops)

All the Great stops, except:

Open diapason
Cornet

Choir(7 stops)

Open diapason(gamut G)
Stopped diapason
Principal
Flute
Twelfth
Fifteenth
Bassoon

Echo(11 stops)

Open diapason
Stopped diapason
Principal
Flute
Twelfth
Fifteenth
Tierce
Larigot
Trumpet
Vox humana
Cremhorn

Compass:
Gt & Ch, 50 notes (GG short octaves to C in alt.) Echo, 25 notes (middle C to C in alt)

A 'spare stop' on each manual, except Echo.
Drum pedal, tuned to GG

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3. ST.MARY REDCLIFFE, BRISTOL — Harris and Byfield, 1726

Great(11 stops)

Open diapason
Open diapason
Stopped diapason
Principal
Twelfth (GG)
Fifteenth (GG)
Tierce (GG)
Sesquialtera(GG), V ranks
Cornet(mid.C), V ranks

Chair(6 stops)

Stopped diapason
Principal
Flute almain
Flute
Sesquialtera, III ranks
Bassoon

Swell(9 stops)

Open diapason
Stopped diapason
Principal
Flute
Cornet, III ranks
Trumpet
Hautboy
Vox humana
Cremhorn

Compass
Gt, GGG-D, 63 notes
Ch, GG-D, 56 notes
Sw, Middle C-D, 32 notes
Pedals, GGG-GG, 13 notes(no pipes)

Octave coupler (cf.p.8)

(Specification from the builders' original advertisement, preserved in the church, and transcribed by Freeman, Org.25.114)

(Specifications — Introductory Chapter — continued)

4. ST.MARGARET'S, KING'S LYNN — Snetzler,1754

Great(12 stops)	Choir(7 stops)	Swell(8 stops)
Bourdon (GG)	Dulciana	Open diapason
Open diapason	Stopped diapason	Stopped diapason
Stopped diapason	Principal	Dulciana
Principal	Flute	German flute(mid.C)
Twelfth	Fifteenth	Cornet,IV ranks
Fifteenth	Bassoon	Trumpet
Tierce	Vox humana	French horn
Sesquialtera,IV ranks		Hautboy
Furniture,III ranks		
Cornet(mid.C),IX rks		
Trumpet		
Clarion		

Compass:
Gt & Ch, GG(no GG sharp) to E, 57 notes
Sw, Tenor F to E, 36 notes
(N.B. Sw keys down to GG - lowest 21 notes from 3 borrowed Ch stops)

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5. ST.GEORGE'S CHAPEL, WINDSOR — Green, 1790

Great(11 stops)	Choir(6 stops)	Swell(7 stops)
Open diapason	Stopped diapason	Open diapason
Open diapason	Dulciana (FF)	Stopped diapason
Stopped diapason	Principal	Dulciana
Principal	Flute	Principal dulciana
Twelfth	Fifteenth	Cornet,III rks
Fifteenth	Bassoon	Trumpet
Sesquialtera,III rks		Hautboy
Mixture,II rks		
Cornet(mid.C),IV rks		
Trumpet		
Small trumpet		

Pedals "up to C"

Organ totally enclosed

Compass:
Gt & Ch, FFF (no FFF sharp) to E, 59 notes
Sw, Tenor F to E, 36 notes

No.4 from "John Snetzler and his organs" by Andrew Freeman, Org.14.39

No.5 from "Notes on English Organs" by C.W.Pearce, p.87

(Specifications — Introductory Chapter — concluded)

6. ST. JOHN'S CHURCH, HACKNEY — G.P.England, 1796

Great(12 stops)

Open diapason
Open diapason
Stopped diapason
Principal
Twelfth
Fifteenth
Tierce
Sesquialtera, III rks
Mixture, II rks
Cornet(mid.C), V rks
Trumpet
Clarion

Choir(6 stops)

Stopped diapason
Principal
Flute
Fifteenth
Vox humana
Bassoon

Swell(6 stops)

Open diapason
Stopped diapason
Principal
Cornet, III rks
Trumpet
Hautboy

Compass:
Gt & Ch, GG (no GG sharp) to F, 58 notes
Sw, Tenor F to F, 37 notes

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7. WINCHESTER CATHEDRAL — Avery, 1799

Great(10 stops)

Great open diapason
Open diapason
Stopped diapason
Principal
Twelfth
Fifteenth
Sesquialtera, III rks
Mixture, II rks
Cornet(mid.C), IV rks
Trumpet

Choir(5 stops)

Dulciana(tenor C)
Stopped diapason
Principal
Flute
Fifteenth

Swell(6 stops)

Open diapason
Stopped diapason
Principal
Cornet, III rks
Trumpet
Hautboy

Compass:
Gt & Ch, GG (no GG sharp) to E, 57 notes
Sw, Fiddle G to E, 34 notes

No.6 from "George Pike England", by Andrew Freeman, Org.21.47

No.7 from "Notes on English Organs", by C.W.Pearce, p.75

CHAPTER ONE — 1801 TO 1822.

General

During the first two decades of the new century, there were no outstanding developments or innovations. The average large organ was still about twenty-four to twenty-six stops, with three manuals and either no pedals at all or else an octave or so of "pull-downs". However, there soon began to occur occasional signs of progress towards remedying this, the greatest weakness of all; after 1804, there were few instruments which did not have at least "pull-downs" of some sort, and independent pedal-pipes were making an appearance here and there. The manual compass remained chaotic, with each builder following his own fancy; similarly, there was not the slightest uniformity in the pedal department.

The Great organ

Throughout this period, the usual Great consisted of ten or twelve stops: one or two open diapasons, stopped diapason, principal, twelfth, fifteenth, two or three compound stops and a trumpet. Isolated
1) variants occurred, naturally. At York, for example, in 1803, there were three open diapasons, the vast space of the Minster demanding something above the normal level. (A great deal more will be heard about this building in the next chapter). Double diapasons appear in 1805 at the
1) Foundling Hospital — probably, though of this we have no confirmation, with pedal pulldowns attached — but these were on the lowest two octaves
1) only, as they were also in 1808 at the Portuguese Chapel in London. Never-

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1. Specification given at the end of this chapter.

theless, Hugh Russell and G.P.England, the respective builders, deserve honourable mention; and there was another example of a double diapason
1) in 1820 at Boston Parish Church by Nichols. Here, there is no specific indication that these pipes were not full-compass: but it is not safe to assume therefore that they were !

It is noticeable that, whenever a builder wished to enlarge an organ, in order to meet the demands of a very large cathedral or church, his only course was to duplicate stops of similar pattern; for instance, there were two 'principals' at Hereford (Elliott, 1806) and at King's Lynn (Lincoln, 1816), the latter having also two 'fifteenths'.

The usual compound stops were the Sesquialtera of three or four ranks, the Mixture or Furniture of three, and the Cornet, from middle C upwards, of three to five. The Sesquialtera was normally the lowest-pitched, with the interval of a sixth prominent in its make-up and a consequent slight reediness of effect; the Mixture and Furniture were of higher pitch, while the Cornet, as we have already noticed, was a brightly-voiced solo stop — not intended, as the others were, for ensemble; it was sometimes designated 'solo cornet'.

The trumpet was an invariable constituent of the Great; and in larger instruments (e.g. York and King's Lynn) it was accompanied by a clarion. Quite often, the trumpet was divided in the middle of its compass, the two halves being drawn separately; this enabled solos played on the treble half of the Great to be accompanied by fluework only on the other half of the same manual. Mention must be made of the Nason, which puts in an occasional appearance: it was a quiet, sweet-toned 4-foot flute stop of good blending quality, and made an admirable superoctave for the stopped diapason.

The compass of the Great — as, indeed, of the whole instrument — was by no means standardised yet. As many as nine different compasses are found; but there is one which was adopted in more than half the organs of which we have record during this particular period. This was a range of 58 notes, described as "GG long-octaves to F", and it began on the G below the bottom CC of the modern organ compass (i.e. 10 2/3 ft GG); usually the lowest GG sharp was omitted, as was noticed in several of the specifications given at the end of the Introduction, and thus the total range was a little under five octaves.

The term "long-octaves" was used to distinguish this compass from the older "short-octave" keyboard, which still lingered on into the period under discussion. A short-octave manual had one white key below the lowest CC, and this sounded GG. The apparent CC-sharp key actually sounded AA; and the notes GG-sharp, AA-sharp and CC-sharp were omitted altogether, being seldom required as keynotes under the then universal conditions of unequal temperament. The organs in which the short-octave compass remained were usually rebuilds of older instruments in which the original pipes were not increased in number: St.Alban's Cathedral (Gray, 1820) was a case in point, with the old Father Smith and Byfield compass of GG short-octaves to D, 52 notes in all.

At the other extreme lay the Foundling Hospital, with a com-

pass of no less than 78 notes. This was a rebuild, by Hugh Russell, of Parker's 1768 organ, with 16 notes to the octave. It will be remem-
1) bered that Smith had introduced "quarter-notes" into his Temple organ: he had provided two pairs of 'split notes' in each octave, whereas Parker had four pairs. These were controlled, not by raising the rear sections of the particular black key as Smith had done, but by a system of adjustable levers on either side of the keyboards. However, neither Smith nor Parker nor Russell managed to win any converts for their systems; organists were not sufficiently bothered by the disadvantages of unequal tun-
2) ing — and the view has been expressed in recent years that these disadvantages have in any case been greatly exaggerated by modern writers.

The Swell Organ

It must be clearly understood at the outset that the English "full swell" as we think of it now, with its surging blaze of fiery reeds and its sparkling chorus of light flues, was not yet even a twinkle in Father Willis' eye. In fact, his claims to parenthood are seriously diminished by the knowledge of the most interesting reconstruction of
3) the organ in Seville Cathedral, Spain, in 1703. In that year, almost a decade before Jordan's invention, a swell-box was installed at Seville, and the thirteen stops enclosed within it have a remarkable resemblance to the specification of the English Swell of more than a century and a

1. Cf. supra, p. 9
2. Scholes, "The great Doctor Burney", Vol.2, p.220
3. Sumner, "The Organ", p. 94

half later — fluework up to mixtures (seven ranks of them) and five chorus-reeds 16,8,8,8,4. The resemblance is not quite coincidental: for Cavaille-Coll worked on the organs of Northern Spain as a boy; and his admiration for them was certainly communicated to young Willis, who often visited him and studied his work.

The Swell as we find it in the early eighteen-hundreds remained practically as it had been since Jordan's time. Smith's innovation of the Echo as the uppermost manual of three, enclosed completely in a box to provide effects of remoteness and contrast, was really a smaller version of the Great with a much-abbreviated compass. The subsequent fitting of a sliding front to the box did not alter the tonal scheme at all; and thus we find, nearly a hundred years after the great discovery, that our Swell consists, in the large majority of organs, of about six stops — open diapason, stopped diapason, principal, cornet 3 ranks, hautboy and trumpet. Variants occurred, but very rarely; sometimes a fifteenth instead of the cornet, occasionally a clarion was added, here and there a German flute or a piccolo; but generally speaking the Swell department showed more uniformity of content than any of the other sections of the organ.

An even greater variety of compasses is found than on the Great: ten at least. Two of these, however, found the most favour: the 36 notes from Tenor F to E, and the 37 notes from Fiddle G to F. Others range from 27 notes Middle C to D up to 40 notes Tenor D to F at Newark (G.P.England, 1804). England's Swell at St.Margaret's, Lothbury (1801)

1) is described as Gamut G to F; but as there is no record of the number of pipes, it is not clear which F is meant. Assuming that it is the same F as the other top notes, the Lothbury swell-compass is 47 notes. The only other Swell to have extended so low was the extraordinary Byfield and Harris organ at St.Mary Redcliffe, Bristol. This instrument was at one time believed to have had a Tenor C Swell; but it was found that the lowest seven keys were dummies; fiddle G was the actual bottom note.

The Choir organ

The term "choir" merits a few words of explanation in itself, before the detailed consideration of the instruments of this period is approached. At one time the name was generally explained as being derived from the function of this part of the organ in accompanying the choir in its own portion of the service; the name "chayre" or "chaire" which occurs throughout the 17th and 18th centuries was brushed aside as being a corruption of the word choir.

However, more recent opinion has come round to the view that the term "choir" is itself the incorrect and baseless corruption. It has been shrewdly pointed out that, had this manual really been named from its duties in the accompaniment of the choral parts of the liturgy, it would have been described as the "quire" organ -- the earlier spelling of the word, which can still be seen in the famous rubric in the

1. Gamut G refers to the note on the bottom line of the bass stave, an octave below Fiddle G.

Book of Common Prayer. The word "choir" in its organ sense began to appear in the eighteenth century, largely through historians transcribing what they mistakenly thought was a misspelling, but the older version still persisted widely.

Two possible explanations can be offered for the meaning of "chair" in this context: either that this part of the organ was placed just behind the organist's seat (which indeed often formed a unity with the back of the "chair" casework: or the word may be interpreted in a sense which was not at all uncommon in the seventeenth century, meaning a "helper", "one who takes a turn" (as in the words charwoman or chore). That is to say, this organ took a turn to help or relieve the Great; or perhaps it might be said that the organist "turned" to the "chair" by way of contrast.

Some few years ago, a great deal of classical ingenuity was expended on the theory, derived from a reference in St.Augustine's works to "megiston organon" and "cheir organon", that the word was developed from one of two Greek words, either χείρων ("inferior" or "lesser") or χείρ ("hand"); the significance of the latter derivation being that this part of the organ was descended from the hand-operated or "portativ" instrument, as distinct from the larger "positiv".

For better or for worse, then, the expression "choir organ" had ousted the "chair" by the end of the eighteenth century, and must be accepted thenceforward. We have seen how Samuel Green's work in developing the Swell had resulted in the Choir organ's relegation from the second to the third keyboard in importance; and it now occurs only as the third manual of a three-manual organ. During the period now under consideration, it was unenclosed, and consisted usually of about six stops. The typical specification was: dulciana, stopped diapason, principal, flute, mixture of two ranks, and a soft reed (though the mixture tended to disappear latterly and to be replaced sometimes, but not always, by a fifteenth).

The dulciana, which had become increasingly popular in the later years of the previous century, was found to be especially useful as a quiet foundational stop on the choir, in preference to the open diapason which had hitherto formed the basis of this section. The mixture was sometimes a sesquialtera, sometimes a furniture, but was almost always two ranks only — very rarely three. The reed was either a cremona, bassoon, hautboy or vox humana.

The Choir organ at Wakefield Parish Church (now Cathedral), built by William Gray in 1804, boasted a stop which the original specification proudly described as "New invented Violoncello", a possible indication that the Choir was already beginning to be regarded as an embryo Solo department. There is a mention of a double diapason in the Choir at St.Anne's, Limehouse, after Russell's 1810 rebuild; but this is dubious, being quoted from a G.P.England manuscript no longer in existence; and another version of the specification has no choir double.

The compass remained, as it always had been, in exact correspondence with that of the Great; and as yet there is no trace of this department of the organ being enclosed. It was still designed as an accompanimental, contrasting, "small Great" or "ruck-positiv" section. As the century went on, this clear conception of the Choir organ's function was to undergo a marked deterioration, until it became, even in four-manual instruments, a heterogeneous collection of individual solo stops.

The Pedal Organ

Although detailed records of repairs and reconstruction are not plentiful, and although the inexplicit use of the word "pedals" still necessitates a great deal of possible evidence being passed over as doubtful, there are nevertheless sufficient references to present a reasonably clear picture. This shows unmistakable signs of reform, of an awakening of the desire to bring this department into line with Continental pedal-organs: now begins the remarkable development, or series of developments, which is to lead in the course of half-a-century to Britain's three-hundred-year deficit being wiped out. Indeed it is not an exaggeration to say that British organ-building made more progress in fifty years than the Continent had done in four times that period, certainly as regards the pedal-organ.

Westminster Abbey's octave of unison GG pedal pipes (down to 10 2/3 ft) retained their monopoly for only a fraction of our century;
1) for Avery was at work on the organ in Trinity College, Cambridge, in 1801 — and this work included the provision of pedal pipes. In this

1. Hopkins and Rimbault, p.541, refers to Avery's having installed pedal pipes. Org.32.51 gives the date of his work at Trinity.

connection, it is sad to have to relate that Avery, who is definitely the hero in our account of the pioneer days of Britain's Pedal-organ, was held in a very different regard by the worthy inhabitants of Cambridge. "He was a clever enough builder" we are told, "when he chose to apply himself, but unfortunately bottle and flagon were his enemies. On his departure from Cambridge, he left behind him so unsavoury a reputation that for some time tradesmen in the town viewed all organ-builders with great suspicion." Happily, however, British organ-builders have progressed socially as well as professionally, and there is no reason to suppose that Mr. Henry Willis or Mr. John Compton would meet with anything but the utmost civility during the course of a shopping expedition in Cambridge to-day.

1)

Avery's work in this city was not confined to Trinity; in 1803 he carried out some repairs at King's College, and Leffler reported in 1806 that there was "an octave of pedals" — an annoyingly vague piece of information. An interesting light on the attitude of organists is the fact that in this chapel, one of the foremost of the greater churches as far as music was concerned, we are told that John Pratt (organist of King's from 1799 to 1855) remained "a manual player to the last"; and even after Hill had replaced the toe-pedals by "German pedals", still "the elderly organist did not avail himself of them in any effective way".

2) 3)

In 1804 another builder entered the field of pedal-reform,

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1. Org.32.61.
2. Pearce, "Notes on Old English Organs" p.78
3. Dickson, "Fifty years of Church Music"

in the person of G.P.England. At Newark Parish Church, in his new organ there, as well as "pedals to take down the keys" there was also "an octave of large pipes." These were again of unison pitch, extending down to the 12ft FFF of the manual compass. In this same year,
1) according to some accounts, Thomas Elliott provided the Hanover Square Concert Room with "Nineteen large pipes, CC-F sharp". This seems dubious, however, as the choice of compass is most odd for that date. Moreover, which C was actually the bottom note ? 16ft CCC is the most likely, but a compass starting on CCC is anachronistic so early in the century.
2) There is, indeed, another and more likely suggestion of 1819 as the date of this instrument.

Nevertheless, there is no uncertainty that Elliott, in 1806, equipped Hereford Cathedral with pedals and pedal pipes, though their number and compass is not recorded. More definite information is available about G.P.England's work at Great Yarmouth Parish Church in 1812, when he added an octave and a half of pedals, and wood pipes from GG to Tenor C, consisting of four unison pipes from 10 2/3ft GG up to BB, and then thirteen double pipes from CC to C (i.e. 16ft to 8ft length). This was an example of the idiotic and inexplicable system known as "return octaves", and it is an extraordinary indication of the confusion and indifference prevailing in the minds of British organists that this type of pedal-compass was allowed to become so general. Very little thought is necessary to understand its futility, though Hopkins launched
3) into two pages of music-examples in order to drive home his condemnation.

1. Sumner, "The Organ", p.375
2. Scholes, "Oxford Companion to Music" (7th edition), p.664
3. Hopkins and Rimbault, pp.230-1

During the second decade of the century, other builders began following in the footsteps of Avery, Elliott and England. The latter's organ at Durham Cathedral in 1815 (his last) was completed by his foreman, son-in-law and successor Nicholls, and included seventeen "dwarf" pedals — as the short toe-pedals were sometimes known — and pedal pipes. In 1817, Hancock put an octave of GG pedals and unison pipes into his rebuild at St.Sepulchre's, Holborn; in the next year, St. Saviour's, Southwark, had an octave and a half of GG pedals and double open wood pipes beginning at 21 1/3ft GGG, by Davis; H.C.Lincoln at Exeter Cathedral in 1819 added, inter alia, pull-downs of similar compass and wanted to add twenty independent open pipes, but his proposal was rejected, presumably because they were considered unnecessary and expensive luxuries. Bewsher and Fleetwood of Liverpool added pedal diapasons to the organ at St.Patrick's Cathedral, Dublin, in about the year 1820; and at St.Mary's, Nottingham, there was a rank of pedal pipes by Buckingham, added at "the beginning of the century" — which may be guessed at the second decade, his most active period.

This evidence is sufficiently continuous and widespread, in proportion to the number of organs whose detailed records remain to us from those times, to support the contention that the pedal-department was at last beginning to come to life in Britain; and we shall shortly find immense strides being taken in the second quarter of this remarkable century.

<u>Mechanism and Controls</u>

<u>(a) Couplers.</u> There is probably less information about these very necessary aids to registration than about any other part of the organ up to and including the first two decades of our century. The authorities seem to share no very great measure of certainty or agreement on the origins of couplers: for instance, Whitworth writes:

1) "Probably taking their origin from the wire connections by means of which the old toe-pedals worked the manual keys, devices for making one keyboard act upon another were introduced about the beginning of the seventeenth century. These devices were aptly termed couplers."

Sumner says nothing as to their first appearance, but his brief reference must be recorded:

2) "Inter-manual coupling was effected in organs until the end of the eighteenth century by drawing one manual forward by means of knobs on each key-frame, so that small projections on the ends of the keys of one manual engaged with the key ends of an adjacent manual."

Hopkins and Rimbault do not even venture to speculate on the origins of inter-manual coupling; the dates given by them refer to innovations which will be discussed in the next chapter; but in Grove, Hopkins does at least give the only definite statement to be found in all the historians:

3) "The Redcliffe organ.......contained the first octave coupler that was ever made in England; in fact, the first coupler of any kind with which any organ in this country was provided."

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1. Whitworth, "A student's guide to the Organ", p.8
2. Sumner, "The Organ", p.311
3. Grove (2nd edition), Vol.II, p.596 referring to the Harris and Byfield organ of 1726.

These quotations, though indefinite (with the honourable exception of Hopkins) would seem to indicate that couplers did exist during the eighteenth century. It is therefore all the more surprising that a most careful search through the records of organs built during that period, of which details have survived, reveals absolutely no allusion whatsoever to couplers, whether in newly-built instruments or in occasional reconstructions of older ones. It is not necessarily safe to infer from this that there were no such things as couplers before the beginning of the nineteenth century, because obviously it is only the stop-lists of many organs which have been preserved, and not the complete specification; mechanical accessories, if any, may often have been taken for granted. Nevertheless it is reasonable to assume that the Harris-Byfield device at Bristol did not produce a flood of imitators; and it may be accepted that, in general, eighteenth-century organs were seldom, if ever, equipped with any form of coupler.

During the period now under discussion, we are still little the wiser; some instruments possibly had couplers, but extremely few. Hopkins and Rimbault offer some references which cannot with certainty be accepted as belonging to the first quarter-century, for that work often fails to make mention of alterations or additions which may have intervened between the quoted date of an organ's installation and the date of the treatise itself. For instance, the organ at St.Margaret's, Westminster, is described as "built by Avery in 1804.........stood thus in 1858" and three couplers are included. Again, at King's Lynn, details are given of dates of the various rebuilds, in 1796, 1816 and 1852 — but Hopkins has omitted to tell us if the three couplers in his specification were also added at the latter occasion, or earlier: it is rather tantalising to think that they might date from 1816, but we dare not assume so.

There are indeed only two assured references. One is to Bath Abbey, where the organ, as rebuilt by the local craftsman John Holland in 1803, had a Choir-to-Great coupler; and the other is to Southwark Cathedral, where in 1817 James Davis carried out a number of modifications and repairs, including the addition of three couplers — Swell-to-Great, Great-to-Pedal and Choir-to-Pedal. One might easily try to deduce from these two cases, separated by more than a decade, that couplers were not at all uncommon, but it would be mere conjecture and historically unsound. There is much more information concerning the years to be covered by Chapter Two, and doubt will then yield to certainty regarding this department of organ-building.

<u>(b) Action.</u>

It is not the intention of this work to delve into the intricacies of mechanism in the various kinds of action employed during the century; it is the actual application of this mechanism [illegible] and aspects which is the object of study. Suffice it to say, then, that until this nineteenth century was half over, the action which connected keyboard with pipework remained, in its essentials, as it had been for two centuries or more. This was the action known as "mechanical" or more usually "tracker", in which the player's finger was in direct contact with the pallet admitting wind to the pipe, through the medium of a series of wooden stickers, backfalls and trackers, as they were termed. This type of action was perfectly effective in a small organ with a built-in console, and indeed it is sometimes used to-day in such instruments; but as organs increased in size, as couplers came into more general use and as heavier wind-pressures increased the resistance to be overcome by the pallet (and therefore by the finger), so it was that the quest began for means of lightening the touch. Chapter Two will have much to say in this connection.

(c) Composition pedals

Here at last is one important improvement that first appeared during the first decade of our century: the transformation of the old "shifting movements" into rudimentary "composition pedals" by J.C.Bishop, a builder of remarkable inventive capacity. The shifting movement seems to have originated immediately after the Restoration, in Dallam's organ
1) at Windsor in 1660-1; and it was used quite often by Father Smith in his smaller, one-manual organs. This device was a pedal which silenced certain of the higher-pitched stops, reducing the registration to diapasons alone, or diapasons and principal; the pedal could be hitched down, and, when it was released, strong springs restored the "status quo ante". It was a useful aid at a time when both hands were occupied on the keyboard so that the withdrawal of one hand for stop-changing purposes resulted in a noticeable weakening of the harmony. The foot

1. cf. supra, p.8

were, alas, seldom otherwise engaged; and by means of the new shifting movements it was now possible to achieve more variety of tone-colour, and some sort of contrasting effect.

In the early years of our century, there were examples of shifting movements installed in G.P.England's organs at South Lambeth Chapel in London (1808), where there was a pedal reducing to diapasons and principal, and at Richmond Parish Church, Yorkshire (1809), where there were two, reducing respectively to diapasons and principal, and to stopped diapason only.

1) This was the year, according to Hopkins, in which J.C.Bishop produced his improvement; his new composition pedals abandoned the springs, whose stiff resistance had been one of the disadvantages of the old system, and now the combination of stops given by depressing the pedal remained in operation until the organist altered it by hand or by another composition pedal. No longer was it necessary for the pedal to be held or hitched down. These early examples were "single-acting", that is to say they were able only to draw out the given stops; and they were superseded before long by the "double-acting" type, which also withdrew any unwanted stops that happened to be out already.

Bishop's active period of organ-building, so far as surviving records go, began a few years after this time (1822 seems to be the date of the first organ for which we know him to have been responsible), and one would be disposed to imagine that he would by that date have employed composition pedals entirely. It is therefore curious to find —

1. Grove (2nd edition), II,598.

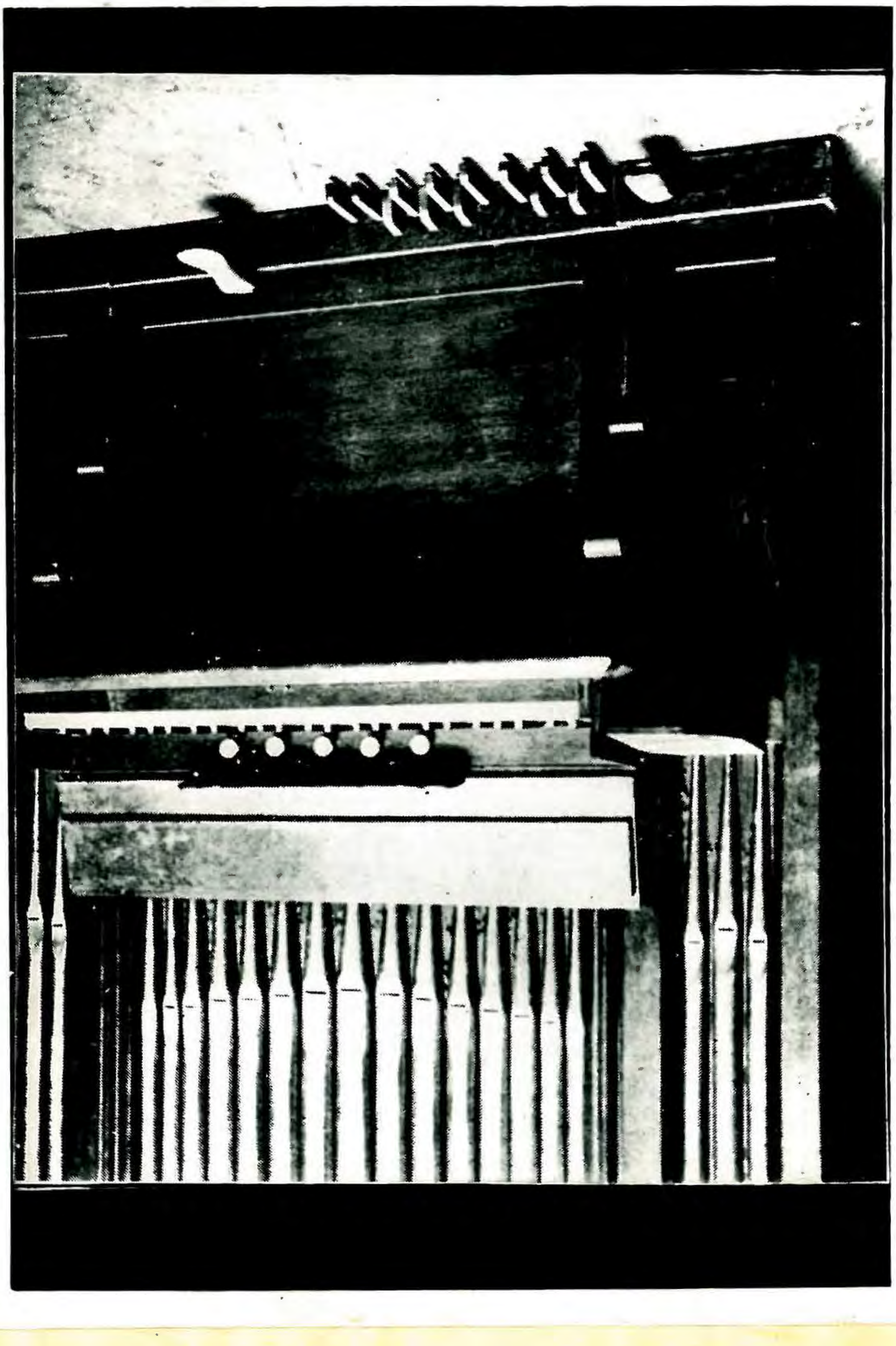

PLATE II.

A typical early pedalboard.

A small early-nineteenth-century Bevington organ, showing an octave of short toe-pedals of the "pull-down" period. The centrally-placed large pedal is probably a "shifting movement".

(Photograph by Andrew Freeman, by permission of Messrs. Bevington & Son, in Org.1.81.)

if a momentary anticipation of Chapter Two's period may be permitted — that in two quite large and important organs built by him in 1829 and 1833 (St.James', Bermondsey, and St.Edmund, Lombard Street) Bishop supplied not only composition pedals, but also "shifting movements to swell". This point will be referred to again in the next Chapter.

(d) The console — and a note on the Apollonicon.

Although "long movements", as we have seen on page 18, had been used on at least one (perhaps two) instruments in the previous century, no further ventures in this direction seem to have been made for many years thereafter — not, in fact, until 1823, with one curious exception. Consoles remained much as they had been for generations past: non-overhanging manuals, stop-knobs not engraved but having their labels pasted on the stop-jambs, which were themselves straight and not at the convenient angle to which we are accustomed. Everything was, by modern standards, awkward and clumsy; stop-knobs were often difficult to reach and had a long, stiff "draw" — stiffness which was inclined to vary with the changing weather conditions of the year, as also was the depth and responsiveness of the touch. Admittedly there was little temptation to experiment with detached consoles as long as the action was "tracker", with an increase in the weight of the touch for every foot of additional distance between keys and pipes.

When the reconstruction of the Exeter Cathedral organ was under consideration in 1818, the firm of Flight and Robson was consulted; 1) one of their proposals was "A new mechanical arrangement by which the

1. Org.6.107

three organs, viz., the great organ, the choir organ and the swell, may be acted upon separately by Three Separate performers and enabling the whole grandeur of the Instrument to be displayed at once, which they particularly recommend from its situation."

This firm's proposals were rejected in favour of others by H.C.Lincoln, but the Flight and Robson suggestion is an indication that intermanual couplers were not in general use, for their scheme seems to have been little else than a method of combining the three keyboards simultaneously. It is also interesting to observe such a plan emanating from this particular firm, for it was they who, in the previous year (1817) had constructed the instrument which provides the solitary exception to the otherwise complete absence of detached consoles referred to on page 45.

This "Apollonicon", as it was called, was remarkable in a number of ways, and merits a few words of description at this point; but it was a "freak" organ, and was outside the main stream of evolution in organ-building. It led to no new series of developments which may be said to have stemmed from this single prototype. Its immediate relevance to the present subject is that it had not one but several detached and reversed keyboards, so that the players faced away from the instrument in the fashion which has long been customary in Continental churches. Authorities differ as to the exact number of these keyboards; Grove
1) gives five — a central keyboard of five octaves, abd two on either side with only two octaves each, the central keyboard having a swell (the

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1. Grove (2nd edition), I,p.74

writer does not say if the manual was totally or only partially enclosed) as well as composition pedals and two octaves of pedals. Other writers
1) give the number of "consoles" as six. It is indeed unfortunate that no detailed description has come down to us; Grove mentions 45 stops and about 1900 pipes; but these two figures are hard to reconcile — this number of pipes would be sufficient for not more than about 32 stops of the average compass of that time. However, the explanation probably lies in the fact that four of the detached keyboards were of two-octave compass only, which would of course enable a larger number of stops to be provided by the given number of pipes than was the case with other contemporary organs. Suffice it to say that this instrument has never been remarked upon for its mere size; if it had indeed contained 45 stops of full compass, it would have exceeded any other in the country by nearly twenty stops at the date of its construction — though it was emphatically surpassed by York when it was six years old.

It has been "mentioned in despatches" for its multiplicity of consoles, for its large and intricate barrel mechanism, and even for the
2) kettledrums it contained, which were struck by "curiously contrived machinery". (In this respect, the Apollonicon was an ancestor of the "wonder organs" which infested the world's cinemas during the thirties and forties of the twentieth century, but which are steadily and noticeably becoming
3) less common). A writer in 1825 reported that the six performers, "acting in concert, develop the various powers of the organic construction, and

1. D.E.L.Salwey (Org.II.206) and Scholes, "Companion", p.554
2. Grove (2nd edition), I.75
3. Dr. Busby, quoted in Scholes, "Companion", p.554

operate on the nerves and feelings of the auditors in a truly surprising manner". One can well imagine it — especially on the entry of the kettledrums !

Besides its normal use this organ was an example of the "barrel-organ" which had been in widespread use at the end of the eighteenth century and in the early part of the nineteenth, particularly in the smaller country churches. Barrels, if carefully made — and this required an artist as much as a craftsman — were far more satisfying, musically, than the amateur efforts of some unskilled son or daughter of the village might have been, though it was a pity that the increasing use of these soulless machines resulted in the disappearance of many a picturesque village-church orchestra. By means of spirally-pinned barrels, it was possible to perform quite long compositions such as operatic overtures and symphonic movements on instruments like the Apollonicon in a manner which observers described as remarkably effective. Burney
1) was an enthusiastic admirer of the barrel-organ; and the approval of a musician of his experience is not to be treated lightly.

The Apollonicon was publicly exhibited from 1817 to 1840, and recitals were given on it by some of the leading organists of the day; but it was at lenght dismantled, and incorporated in other organs; thus this celebrated instrument disappeared without trace.

(c) Wind-supply.

This department of the organ had remained, in principle, almost unchanged for centuries, until quite late in the eighteenth, when

1. Rees's Cyclopaedia, article on the Barrel-organ, c.1805.

the older "diagonal" bellows began to give way to the newer "horizontal", as stated on page 17. As far as British organ-builders were concerned, the last organ to be blown by diagonal bellows (at least, among organs of any importance) was that by Avery, at St.Margaret's Church, Westminster in 1804; German builders, however, continued to prefer this type, and they appeared in Schulze's large Doncaster organ in 1862. A clear and simple exposition of the working of the two kinds of bellows is set
1) out in Hopkins and Rimbault, and need not be entered into here, except to emphasise that the horizontal type had every advantage in its favour; economy of means, regularity and evenness of wind, and ease of operation. Nevertheless, there were occasions when unsteadiness of wind did occur, usually if a large number of bass keys was sounded at once and again when released together. In the first instance, there was a momentary drop in wind-pressure through the sudden demands of the larger pipes, until the intake of wind from bellows to wind-chest accelerated and so adjusted itself; and in the second place, this acceleration of supply caused a momentary excess of pressure when the bass notes were released.
2) Bishop's invention to counteract this defect will be described in the next chapter. Increased wind-pressures had not yet made their appearance; and organs were still voiced on a general pressure of 2½ or 3 inches.

An important labour-saving contrivance appeared in 1821 at Bristol Cathedral, when John Smith, a local builder of more than local reputation, introduced a blowing-gear in which the five feeders were

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1. Hopkins and Rimbault, p.10
2. The "concussion-bellows", as it was called.

actuated by a single wheel and crank. This apparatus, which Smith installed again at St.James', Bristol (see Chapter Two) and elsewhere, was so easy to work that a boy could cope with the demands of a large organ for an entire service; and it must have given a remarkably steady flow of wind. The Bristol Cathedral mechanism remained in working order until well into the twentieth century.

(f) Tuning and pitch.

Tuning by unequal temperament, of which the most usual method was known as "mean-tone" tuning, had existed since late medieval times, having been established after an even severer struggle than that which was to lead to its abolition; and it was destined to persist in very many British organs until late in the nineteenth century. Equal temperament was first tried-out in one or two organs in the forties, but it was not until after 1852 that its adoption began to be anything more than isolated.

The limited number of keys which were tolerable to the ear under the old system had for some time bothered a few musicians and builders — but not many ! We have observed the efforts of Father Smith at the Temple and of Parker at the Foundling Hospital to increase these limited resources; but the expense and the elaboration of the additional pipes and mechanism, together with the universal attitude of "laissez-faire", resulted in these organs remaining as curiosititas without imitators.

Occasional references will be made to the fluctuations in pitch which organs underwent during the course of the century, and so it will be as well to take stock of the position at the outset.

There was never such a thing as a standard pitch — far from it ! — until late in the nineteenth century. Even contemporaneous organ-builders such as Father Smith and Harris are known to have used markedly differing pitches. The lowness of Harris' pitch was, in fact,
1) one of the reasons leading to his rejection at the Temple. A comparison of music composed at the end of the seventeenth century with the choral music of Tallis and Gibbons in the middle and late sixteenth century indicates a definite lowering of pitch; and this tendency continued until the beginning of the eighteenth century, reaching as low as an A of 395 vibrations per second. (For the sake of comparison, the modern New Philharmonic A is 440).

Handel's tuning-fork, however, may be taken as the average for the second half of the eighteenth century, giving an A of 422.5, which shows an upward reaction — confirmed by the original pitch ad-
2) opted by the London Philharmonic Society in 1813, namely A 423.7. As will be seen later, this rise in pitch continues until the "ceiling" is reached with the "Old Philharmonic Pitch" (as we now term it) of 452.5, from which the inevitable recession to the modern standard followed at the close of the century.

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1. Hopkins and Rimbault, p.191, quoting Macrory's "Notes on the Temple organ".

2. Scholes, "Companion", p.732.

SPECIFICATIONS

(to illustrate Chapter One)

1. ST.MARGARET'S, LOTHBURY, LONDON -- G.P.England, 1801

Great(7 stops)

Open diapason
Stopped diapason
Principal
Twelfth
Fifteenth
Sesquialtera(divided)
Trumpet

Swell(6 stops)

Open diapason
Stopped diapason
Principal
Fifteenth
Hautbois
Trumpet

Compass:
Gt; GG(no GG sharp) to F, 58 notes
Sw; Gamut G to F, 47 notes

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2. YORK MINSTER -- Blyth, 1803

Great(13 stops)

Open diapason 1
Open diapason 2
Open diapason 3
Stopped diapason
Principal
Nason
Twelfth
Fifteenth
Sesquialtera,IIIrks
Mixture, III rks
Cornet(mid.C)IV rks
Trumpet
Clarion

Swell(8 stops)

Open diapason
Stopped diapason
Dulciana
Principal
Principal dulciana
Cornet,III rks
Trumpet
Hautboy

Choir(6 stops)

Stopped diapason
Dulciana
Principal
Flute
Fifteenth
Bassoon

Pedal
Keys to C

Compass:
Gt and Ch; GG(no GG sharp) to E, 57 notes
Sw; Tenor F to E, 36 notes

(Specifications — Chapter One — continued)

3. KING'S COLLEGE CHAPEL, CAMBRIDGE — Avery, 1803

Great(11 stops)

Open diapason 1
Open diapason 2
Stopped diapason
Principal
Nason
Twelfth
Fifteenth
Sesquialtera, IIrks
Mixture, II rks
Cornet(mid.C), IVrks
Trumpet

Swell(6 stops)

Open diapason
Stopped diapason
Principal
Cornet, III rks
Trumpet
Hautboy

Pedals: an octave

Compass:
Gt and Ch; GG (no G^{G} sharp) to E, 57 notes
Sw; Tenor F to E, 36 notes

Choir(7 stops)

Stopped diapason
Dulciana(gamut G)
Principal
Flute
Fifteenth
Sesquialtera, II rks
Vox humana

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4. NEWARK PARISH CHURCH — G.P.England, 1803

Great(12 stops)

Open diapason
Open diapason
Stopped diapason
Principal
Nason
Twelfth
Fifteenth
Tierce
Sesquialtera, IIIrks
Mixture, II rks
Cornet(mid.C), V rks
Trumpet

Swell(6 stops)

Open diapason
Stopped diapason
Principal
Cornet, III rks
Trumpet
Hautboy

Pedal pipes
1 octave

Compass:
Gt and Ch; FFF (no FFF sharp or GG sharp) to F, 59 notes
Sw; Tenor D to F, 40 notes

Choir(7 stops)

Stopped diapason
Dulciana
Principal
Flute
Fifteenth
Mixture, II rks
Bassoon

(Specifications — Chapter One — continued)

5. WAKEFIELD CATHEDRAL — William Gray, 1804

Great(11 stops)

Open diapason
Open diapason
Stopped diapason
Principal
Twelfth
Fifteenth
Sesquialtera, V rks
Tierce
Mixture, II rks
Cornet, IV rks
Trumpet

Swell(6 stops)

Open diapason
Stopped diapason
Principal
Cornet, III rks
Trumpet
Hautboy

Choir(7 stops)

Open diapason
Stopped diapason
Flute
Fifteenth
Mixture, II rks
New invented Violon-cello
Principal

Pedals:
"One set of foot pedals from lower octave of Great"

Compass:
Gt and Ch; GG (no GG sharp) to F, 58 notes
Sw; Tenor F to F, 37 notes

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6. FOUNDLING HOSPITAL, LONDON — Hugh Russell, 1805

Great(12 stops)

Double diapason
Open diapason
Open diapason
Stopped diapason
Principal
Twelfth
Fifteenth
Seventeenth
Sesquialtera, II rks
Furniture, II rks
Cornet(mid.C), V rks
Trumpet

Swell(7 stops)

Open diapason
Stopped diapason
Principal
Cornet, III rks
Trumpet
Hautboy
Clarion

Choir(6 stops)

Stopped diapason
Dulciana
Principal
Flute
Fifteenth
Cremona (gamut G)

Compass:
Gt and Ch; GG to E (i.e. just under 5 octaves as usual) with 4 extra quarter-notes per octave; 78 notes
Sw; Tenor F to F (3 octaves) with quarter-notes; 48 notes

(Specifications — Chapter One — continued)

7. HEREFORD CATHEDRAL — Elliott, 1806

Great(12 stops)

Open diapason 1
Open diapason 2
Stopped diapason
Principal 1
Principal 2
Twelfth
Fifteenth
Tierce
Small twelfth
Sesquialtera, III rks
Trumpet
Cornet(mid.C), IV rks

Swell(4 stops)

Open diapason
Principal
Cornet, III rks
Trumpet

Pedal pipes

Choir(6 stops)

Dulciana(mid.C)
Stopped diapason
Principal
Flute
Fifteenth
Vox humana

Compass:
Gt and Ch; AA to D, 54 notes
Sw; middle C to D, 27 notes

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8. PORTUGUESE CHAPEL, SOUTH STREET, LONDON — G.P.England, 1808

Great(11 stops)

Double diapason(bass)
Open diapason 1
Open diapason 2
Stopped diapason
Principal
Twelfth
Fifteenth
Sesquialtera, IV rks
Mixture, II rks
Cornet(mid.C), IV rks
Trumpet

Swell(6 stops)

Open diapason
Stopped diapason
Principal
Cornet, III rks
Trumpet
Hautboy

Choir(5 stops)

Dulciana (tenor C)
Stopped diapason
Principal
Flute
Cremona (tenor C)

Pedals: "Pull-downs" up to D —(the Great double consisted of 24 open wood pipes.)

Compass:
Gt and Ch; GG long octaves to F, 58 notes
Sw; Tenor E to F, 38 notes

9. RICHMOND PARISH CHURCH, YORKSHIRE -- G.P.England, 1809

Great(8 stops)	Swell(6 stops)	
Open diapason 1	Open diapason	Two shifting movements:
Open diapason 2	Stopped diapason	1, takes off all but
Stopped diapason	Principal	stopped diapason.
Principal	Cornet, III rks	2, takes off all but
Twelfth	Trumpet	diapasons & principal.
Fifteenth	Hautboy	
Sesquialtera & Cornet, IV rks		
Trumpet(divided)		

Compass:
Gt, GG long octaves to F, 58 notes
Sw, Tenor F to F, 37 notes

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10. ISLINGTON CHAPEL-OF-EASE -- G.P.England, 1814

(now St.Mary's, Holloway)

Great(9 stops)	Swell(6 stops)	Choir(5 stops)
Open diapason 1	Open diapason	Stopped diapason
Open diapason 2	Stopped diapason	Dulciana
Stopped diapason	Principal	Principal
Principal	Cornet, III rks	Flute
Twelfth	Trumpet	Cremona(tenor C)
Fifteenth	Hautboy	
Sesquialtera, III rks		
Mixture, II rks		
Trumpet		

Pedals: two octaves of "pull-downs"

Compass: Gt and Ch; GG to E, 58 notes
Sw; Tenor E to F, 38 notes

(Specifications — Chapter One — concluded)

11. ST.MARGARET'S, KING'S LYNN — Lincoln, 1816 (rebuild of Snetzler)

Great(12 stops)

Open diapason
Open diapason
Stopped diapason
Principal
Principal
Twelfth
Fifteenth
Fifteenth
Sesquialtera,IV rks
Cornet(mid.C),V rks
Trumpet
Clarion

Swell(7 stops)

Open diapason
Stopped diapason
Principal
German flute
Cornet, IV rks
Trumpet
Hautboy

Choir(7 stops)

Dulciana
Stopped diapason
Clarabella (??)
Principal
Flute
Fifteenth
Bassoon (mid.C)

Compass:
Gt and Ch; GG to E, 57 notes
Sw; Tenor F to E, 36 notes

(??) Choir clarabella is highly suspect. The source of this specification is Hopkins, who mentions no additions subsequent to 1816 (apart from Holdich's pedal diapason in the fifties), but this is almost certainly one.

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12. ST.BOTOLPH'S, BOSTON — Nicholls, 1820

Great(12 stops)

Double diapason
Open diapason,front
Open diapason,back
Principal
Flute a bec
Twelfth
Fifteenth
Tierce,
Sesquialtera, III rks
Mixture, II rks
Cornet, V rks
Trumpet

Swell(6 stops)

Open diapason
Stopped diapason
Principal
Cornet
Oboe
Trumpet

Choir(5 stops)

Stopped diapason
Dulciana
Principal
Cremona(fiddle G)
Flute

Pedal
Double diapason

Compass: Gt and Ch; GG to F 58 notes
Sw; Fiddle G to F, 35 notes

CHAPTER TWO -- 1825 TO 1850

General trends during the second quarter-century

We embark, in this chapter, upon a description of what may be summed-up as British organ-building's "finest hour". During less than a single generation the modern organ was born and the eighteenth century was left far behind. Many wonderful things were still to happen during the second half of the century: but most of them were the outcome, more or less direct, of developments which had their origin before 1850.

In the next few pages, all the principal departments of the organ will be seen to expand in size, variety, compass and tonal completeness, until they reach basically the dimensions and specifications that we nowadays regard as desirable. The vital breakaway from tracker action; the fourth manual with its own independent stops; heavier wind-pressures; improved coupler facilities; combination thumb-pistons; the "reformed" tremulant; equal temperament tuning; the first appearance of several new tone-colours that have since become a "sine qua non" of organ-design; all those innovations (mentioned at random) and others too, were the products of the second quarter-century. Some of them were solidly established in general acceptance by mid-century; others had made the most tentative of preliminary appearances by then -- but appeared they had, however tentatively and however experimentally. The torch could be handed on, ready kindled, to those that came after.

Many organs and many buildings situated far and wide throughout the country shared in these events; this revolution in organ-building — for such indeed it was — was welcomed and supported everywhere, the more so for being so long overdue. One man stands out among the many who might be mentioned: William Hill, a great genius and pioneer; and his stature is increased by the very numbers of those who so swiftly adopted and propagated his reforms.

It is, perhaps, fitting that foremost among the dozens of remarkable new instruments which helped to initiate and spread this revolution were those erected in Britain's greatest Cathedral Church at York[1) — that city whence Constantine the Great set out on the road that was to lead him to his throne as first Christian ruler of the Roman Empire — and in the magnificent new concert-hall in Britain's largest industrial city, Birmingham. The Church remained, as always, the traditional home of all that was finest in the production of an instrument whose Alpha and Omega must ever be the accompaniment of Christian worship; but the secular Concert-hall was to be responsible during this century for tremendous changes in the organ itself and to an even greater extent in its repertoire.

The Great Organ.

The main development in this period is towards a marked increase in power and size. A well-equipped Great now has fifteen or sixteen stops, and there are several over that figure, including two rather exceptional designs of twenty-four and twenty-five stops. York Minster

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1. "Greatest", that is to say, until the construction of Liverpool's vast new Cathedral in the twentieth century.

comes into prominence at once, with its extraordinary organ built by Ward, a local craftsman, in 1823. It was designed by the Minster's deputy-organist, Dr.John Camidge, and represented a determined attempt to cope with the vast spaces of the building. The Great, of twenty-three stops altogether, was divided into two sections: the "East Great" had thirteen stops and the "Nave, or West Great" had ten. It is curious to note that the eastern section was definitely the larger design, whereas one would have expected the greater power to be directed towards the nave. The flue chorus of the "East Great" includes three unison open diapasons, and is complete up to six mixture ranks as well as a five-rank cornet (which must be considered practically as a solo stop), but with no sub-unison "double".

The "Nave Great" had only one unison open diapason and a four-rank mixture, and its reeds were the quieter clarinet and bassoon, in contrast to the trumpet and clarion of the "East Great". Yet another curiosity of design was the fact that the "Nave Great" was enclosed. It is difficult to see exactly what Dr. Camidge was aiming at in planning this department. The powerful unenclosed section speaks eastward into the choir, while the immense nave, capable of holding a congregation of several thousands, is supported by what appears to be little more than a choir organ, and an enclosed one at that. Were the two sections reversed there would be much more logic in the matter. However, Camidge was soon given the opportunity, such as comes seldom to amateur organ-designers, of trying again — and presumably deriving benefit from the

experience of his earlier effort -- after a religious maniac had conveniently set fire to the organ in 1829. This man objected, we are told,
1) to the fact that "the organ made such a noise of buzz, buzz. Says I to myself, I'll have thee down to-night. Thou shalt buzz no more."[1]

In 1824, a new organ was built for St.James' Church, Bristol, by John Smith of that city, and this too contained a number of novel features which will be described in the various sections of this chapter. Its fifteen-stop Great was very complete as to its fluework, including a tierce and a larigot, i.e. seventeenth and nineteenth, as well as the even rarer twenty-second. These important members of the harmonic build-up were, and are still, more usually found as constituent ranks of the compound stops. The Bristol organ contained seven ranks of mixtures in addition to the now customary 8ft and 4ft reeds; though Hopkins points out that the three-rank sesquialtera merely combines three of the separate mutation stops, so that the mixture-ranks actually totalled four.

It must be remarked that, on paper at least, this Great looks top-heavy, mainly owing to the absence of a flue double; but a purely paper judgement is apt to be misleading, for we know from the few untouched surviving examples that early nineteenth century mutations and mixtures were quietly voiced, and that by their very abundance they combined to give an effect of fullness and richness. One must not examine

1. Org.5.198

these designs with the modern Great in mind, with its solitary three- or four-rank steely-brilliant mixture voiced rather as a complement to the heavy-pressure chorus reeds than as a culminating supplement to the flues. Incidentally, the Bristol design was supervised and doubtless partly conceived by another organist of unconventional views, Edward Hodges, of whom more will be heard later in the chapter.

As this century goes on, we shall observe a gradual whittling-down of the upper-work on the Great, until finally the point is reached where Hope-Jones, in the nineties, excludes anything higher than a 2ft rank. This trend begins to show itself even now, for instance in the organ built by Nicholls (but erected by Gray) in the London church of St. Luke, Chelsea, in this same year of 1824. Here there are no less than five unison diapasons -- three open, two stopped -- and above the level of the fifteenth there are simply a tierce and a mixture (of an unspecified number of ranks, but presumably not more than four.)

1) The first manual "double" appeared at last in Booth's organ at the Brunswick Methodist Chapel, Leeds, in 1828; the first, that is to say, of the nineteenth century, for in 1754 Snetzler's famous King's Lynn instrument, as mentioned on page 14, contained, in the words of Dr.Burney, a "metal stop called the bourdon, an octave below the open diapason" which, he says, "has the effect of a double base in a chorus." The Leeds organ had doubles on all three manuals and on the pedals; that on the Great went down to GGG 21 1/3ft in metal pipes. The design

1. It will be recalled that the double diapasons mentioned on pages 28 and 29 were not full-compass, but were really installed for the benefit of the "pull-downs".

of the Great, though of only eleven stops, reads well. Henceforward, the flue double becomes an increasingly frequent member of most Great organs about this size or more; though two remarkable exceptions occur at Birmingham and York in the middle thirties. Sometimes the stop is divided, usually at Tenor C in organs of CC compass, the bottom octave being available separately as a soft "left-hand bass" under the name of Tenoroon. This device continues to appear even after the middle of the century, when the growth of the pedal department has long rendered it purposeless, except for the lazy, the incompetent or the stupidly conservative, who felt the need for a pedal effect, but would not — or could not — supply it as their continental colleagues had been doing for centuries.

Oldham Parish Church (Elliott and Hill, 1830) had a divided double diapason of CCC compass; its trumpet, too, was divided, but the location of the split is not recorded. Most probably it was at the middle of the keyboard, corresponding with the "Middle C compass" of the Cornet stop, which was by this date obsolescent.

The advocates of reduced upper-work found an active supporter at this time in the builder J.C.Bishop, who was embarking on a consistently maintained policy of removing the solo cornet stop from every organ he rebuilt, and replacing it by a stop of his own invention, the Clarabella, either in addition to the stopped diapason or as a substitute for at least the treble portion of that stop. For instance, his organ at St. John's, Paddington (1831) has nothing above the fifteenth in a seven-stop Great; only tierce and three-rank sesquialtera in the ten-stop Great at Norwich Cathedral (1833); and sesquialtera only among the seven stops at St. Edmund's, Lombard Street in the same year.

What modern journalism would describe as a "key date" in British organ-building history was the year 1834; for it was then that William Hill completed his first instrument for the famous Birmingham Town Hall. This was not the first concert-room organ -- far from it -- but it was the immediate forerunner of the series of large nineteenth-century concert organs that was soon beginning to appear all over Britain and her colonies, in the great new Town Halls which exercised such a valuable influence on the growth of music-making during Victorian times, and without which no municipality could consider itself properly-equipped.

The Birmingham organ, though it included the interesting novelty of a 2ft octave clarion in its Great reed-chorus, was noteworthy in other directions than in the tonal design of its principal manual. In fact, this department was, alas, a glaring example of the typically but inevitably faulty system of large-organ planning at this period. After all, the problem of adapting the eighteenth-century organ -- designed, as it was, for the purpose of accompanying the choir, playing solo voluntaries, and little else -- to the new century's huge congregations and new concert-halls seating two thousand and more, was barely beginning to be appreciated. What wonder, therefore, that the only method of enlargement which at first occurred to designers was that of reduplication: the recipe for a large organ was simply a small organ multiplied by two. Too few colours were available on the tonal palette — one type of open diapason and its corresponding upper-work, one type of stopped diapason, one type of chorus-reed: such was the basis of the Great in the eighteen-thirties, whether of six stops or twenty. The varieties of string and flute tone which provide so many alternative chorus-effects in a large modern organ were still things of the future; the genius of William Hill ensured that this future was not very far-distant.

Contemporary with this instrument was Dr. Camidge's second-born at York. Hill was its builder also; the organ was actually begun by Elliott and Hill, the first part being completed in 1832, the year of Elliott's death; Hill finished the work in 1835, so that in its overall period of construction it both preceded and followed that of Birmingham. It is interesting to see what, if anything, Camidge had learned in the interim.

As far as the Great was concerned, the only radical difference (apart from a downward extension of compass) was that both eastern and western sections were made identical in the new scheme, with twelve stops each and a specification not unlike that of the original "East Great". There were now three unison stops and three of octave pitch, whereas before there had been four and two respectively: and both reeds were now unisons. At any rate, Camidge had decided that the old "Nave Great" was insufficient — and there is no mention of enclosure now.

Hill's rebuild of the organ at St.Peter's, Cornhill (1840), shows a much more healthily varied scheme, with little or no reduplication in its sixteen stops. It certainly seems that Hill was much the wiser for his York and Birmingham experiences. Next year, 1841, at Great George Street Chapel in Liverpool, he included two mutation stops which provided interesting pointers towards the newly-realised importance of the sub-foundational 16ft tone. These were the 5 1/3ft quint and the 3 1/5ft tenth; now these stops constitute the second and fourth harmonics in the series of which the subunison rank is the fundamental, and are not part of the harmonic series of the 8ft unison; they correspond, an octave lower, with the more common twelfth 2 2/3ft and tierce 1 3/5ft.

This quint (but not the tenth) appeared again in 1843 as part of the most complete tonal scheme up to that date. The builder was again William Hill, who dominated British organ-building in the thirties and forties as Henry Willis did later in the century (not that Hill's firm was so very far out of the picture even then.) The eighteen-stop Great on the now reconstructed and enlarged Birmingham City Hall organ had fourteen flue stops, including fifteen mixture ranks, and complete reed chorus from 16ft to 2ft. The reed double was thus making its debut on the Great, though there had already been one on the Swell of Hill's 1841 Liverpool instrument.

Hill was obviously not yet satisfied in his search for the ideal Great, and his next major step was taken at All Saints' Church, Northampton, in 1844. This sixteen-stop Great can be compared in detail with the new Birmingham Great in the appendix of specifications given at the end of this chapter. It will be observed that there are now two flue doubles, one open and one stopped, two different unison reeds and no 2ft reed. Fluework up to fifteenth is surmounted by nine mixture ranks. Hill's Northampton scheme thus provides complete alternative choruses of differing power and quality, and represents a big advance on the Birmingham design. He is clearly undecided as to the value of the 2ft reed; he uses it twice in the next two years, and then never again, doubtless feeling that it adds little which is not already inherent in the ample harmonic development of well-voiced 16, 8 and 4ft chorus reeds.

A rather oddly-planned instrument was installed in St.Olave's, Southwark, between 1844 and 1846. Three men were concerned in its construction: H.J.Gauntlett, who designed it; H.C.Lincoln, who began the building of it; and the ubiquitous (deservedly so) William Hill, who completed it. This was a two-manual of thirty-eight stops of which twenty-five were on the Great — or "Grand" as it was actually designated. Only by guesswork can we apportion the credit for this design;
1) there is no patent reason for Lincoln's relinquishment of the task — he was only fifty-five at the time (the same age as Hill, as a matter of fact) and he lived for another twenty years thereafter. However, we do know that Gauntlett was a man of remarkably advancedviews on organ matters, and he will be referred to again in later pages; it is thus

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1. A likely suggestion is quoted on p.498

not a wildly improbable theory, from what we have seen of Hill's constant
1) quest for perfection, that Gauntlett found in him a more congenial and responsive collaborator in the unconventional scheme he was proposing for St. Olave's.

The Southwark organ is notable , not so much for its size alone, but for its tonal variety; the phase of enlargement by multiplication is drawing to a close. This immense flue chorus begins with a 32ft sub-bourdon (down to Tenor C only, but the bottom octave is of little importance in a manual 32ft, of which this was the first example in Britain). Two more "first appearances" of significance are the viola da gamba and the salicional. This latter is a very small-scale open
2) flue stop, aptly described by Wedgwood as "virtually a dulciana with some interest infused in it"; and the former, invented by Hill, has tapering gemshorn pipes with inverted conical "bells" on top, giving
3) "rich and reedy tones of great refinement, at times even resembling a cor anglais in the lower portion of the compass". There was a novelty among the reeds also, the so-called corno-flute, another of Hill's inventions, though this was not to prove of such lasting value and popul-
4) arity as the two new flue stops. "It possessed wooden tubes, and was of a quiet tone, resembling somewhat that of a modern orchestral oboe... The stop being a reed, the selection of the name was scarcely happy."

Curiously, there is no double reed at Southwark, but the 2ft octave clarion reappears, as it does also in Hill's organ at Ashton-under

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1. They had shared in the design of several notable organs since 1840; e.g. St.Peter's,Cornhill; St.Luke's,Manchester; Great George Street Chapel,Liverpool; and Birmingham Town Hall, 1845. (Grove,II,557.)
2. Wedgwood,"Dictionary of Organ Stops", p.139.
3. ibid., p.11
4. ibid., p.32

Lyme in 1845. This has the double reed divided, tenoroon fashion, a feature which was seldom repeated, being even more pointless than the more popular tenoroon diapason. The Southwark total of twelve mixture ranks is spread over no less than five separate compound stops, two of three ranks and three of two. The tendency at this period was for mixtures to be of three or four ranks, though a five-rank mounted cornet survived Gray's 1844 rebuild at Great Yarmouth Parish Church; and there was another similar cornet at Newcastle Cathedral, by Nicholson of that city in 1845. The admirable organ in Worcester's Shire Hall, by the other and better-known Nicholson of Worcester in 1844, had a five-rank mixture on each of its three manuals.

As the middle of the century drew nearer, the majority of Greats, even in the larger instruments, had no more than two mixtures, totalling six to eight ranks. This, of course, applies to newly-built or rebuilt organs, and not to those older organs from earlier years that were awaiting their turn for reconstruction in the days ahead.

The impression may have been given that William Hill had a complete monopoly of organ-building in the second quarter of the century. This, however, is far from the truth, though it was undoubtedly he who was the pioneer in most of the historically important tonal developments of the period. As will be seen in the Appendix of Organ-Builders at the end of Book One, there were several other fine and active craftsmen among his contemporaries. Mention may be made here of J.C.Bishop, John Gray and his post-1838 partner Davison, H.C.Lincoln, John Nicholson of

Worcester, Telford of Dublin and Jackson of Liverpool, to all of whom references have been made or will be made elsewhere in this and later chapters. The forties also witnessed the early efforts of three artists who, for quality and quantity of output, were to share with Hill the supremacy over their fellows during the remainder of the century — Henry Willis, Joseph William Walker and Henry Bevington.

This was the period in which the "Battle of the Compasses" was waged and, to all intents and purposes, won — by the CC supporters. Although the main impetus came from Hill in the middle thirties, nevertheless it was Smith of Bristol who had the honour, at St.James', Bristol in 1824, of building the first organ whose Great and Choir began at 8ft CC. This compass went up to E, 53 notes, and was clearly one of Dr. Hodges' progressive touches. However, it had no imitators for nearly a decade. Hill's "second York" and "first Birmingham" organs extended from CCC 16ft upwards for respectively six and five-and-a-half octaves. This was an experiment which Hill himself did not repeat (with the solitary
1) exception of Westminster Abbey fourteen years later); and indeed, such a compass was, like the tenoroon, inconsistent with the growth of the pedal department. Others, however, tried it out: Smith at Bath Abbey in 1835 — observe the energetic provincial builder eagerly adopting the latest novelty from the famous Hill organs of the previous year or two — and later, Willis at Gloucester (1847) and Bishop at St.Paul's Cathedral (1850).

1. i.e. in 1848.

These, however, were abnormalities, and were rejected by their proponents just as they had been by Hill, who from 1840 onwards adhered almost without exception to the 54-note compass from CC to F. Other builders followed his example from 1845 until, by the end of the forties, nearly every new organ or reconstruction of importance extended down to CC only. The occasional isolated examples of GG or FFF compass which occurred in the late forties and early fifties were very probably attributable to the fact that the organs in question were only partially restored at the time, and that the funds available were consumed by the more important items of replacing old mechanism and adding to the tonal resources; and of course a number of cases of "long manuals" still being installed must be ascribed to such inexplicable obstinacy as that of S.S.Wesley.

The celebrated dispute between Wesley and Willis over the compass of the St.George's Hall organ at Liverpool in 1855 (to look ahead for a moment into Chapter Three) shows up Wesley in rather a pathetic light; he was trying to put back the clock and to stave off a reform which had already been in nearly universal adoption for ten years or more ! Incidentally, this matter of compass has been discussed in some detail in these paragraphs because the general impression which seems to prevail -- mainly owing to the fame of the St. George's Hall organ and the oft-related accounts of its inception -- is that the CC versus GG issue was still being doggedly fought-out in and after 1855, and that Willis was a solitary David gallantly casting his sling against a still well-established Goliath. However, as the comparative table at the end of this section will show, the Philistine hosts were already in full flight.

The upward limit of the keyboard remained at F, 54 notes, for some years; Robson went up to G at St.Michael's, Chester Square in 1847, and Telford produced the first CC-G 56-note compass (the modern standard) at Radley College, Berkshire in 1848. As will be seen later, this remarkable organ had three full-compass manuals as well as a 32-note CCC-G pedalboard. However, GG-F and GG-G retained their predominance throughout the greater part of the nineteenth century; and we find only one other CC-G example before the mid-century: Robson's instrument at Buxton Road Chapel, Huddersfield, in the year 1850 itself.

Here, finally, is a table showing the compasses used in the principal organs built or rebuilt during the last three five-year periods up to 1850, and the first five years afterwards:-

Years	Total organs recorded	"CC"	"GG"	Others (CCC or FFF)	Unknown	% CC
1836-40	10	2	6	1 (F)	1	20%
1841-45	27	16	8	-	3	59%
1846-50	27	17	2	6 (3F,3C)	2	63%
1851-55	31	22	7	1 (F)	1	71%

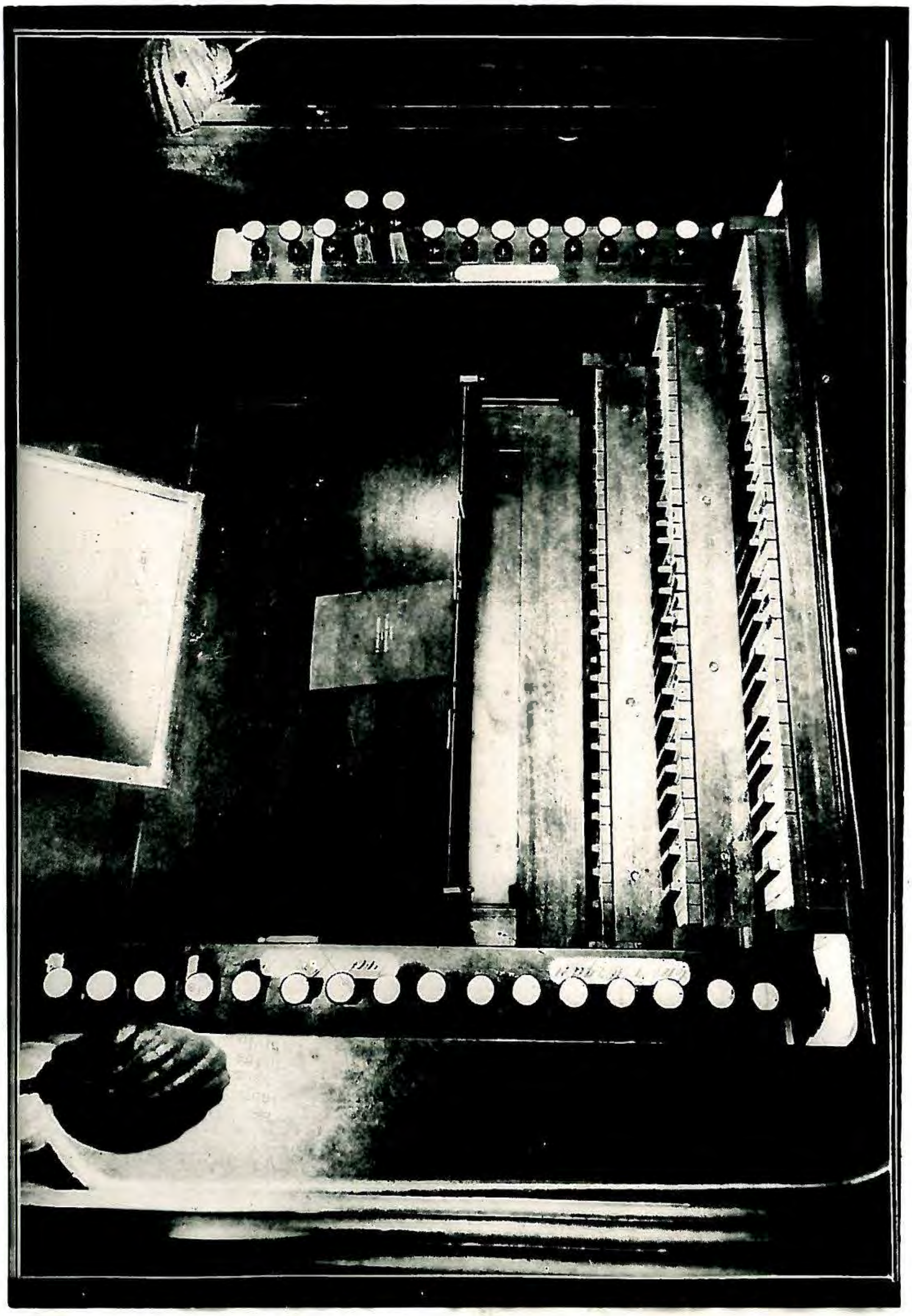

PLATE III.

St. John's Church, Hackney: the 1828 console.

Although this organ was added to by Willis in 1865 and by Speechley in 1889 and 1894, the console for more than a century preserved the same outward appearance, in all essentials, that it had presented since it left the hands of John Gray in 1828. The organ was then a three-manual of twenty-five stops, including an octave of 16ft CCC podal pipes. The extreme height of the upper drawstops should be noticed, and the length of the "draw" of these square-shafted stop-knobs.

(Photograph by Gilbert Benham. In Org.15.105)

The Swell Organ

In this department also, we enter now upon a wonderful period; for it is during the second quarter-century that the Swell progresses from the nondescript handful of stops discussed on page 52, with very little shape or purpose in its design, to something very near to what we now regard as the traditional, "classical" English Swell. Certain ingredients remain to be added, as Chapter Three will relate, but the main framework and many of the details are present by 1850. In 1820, organ-builders seemed to have little idea about the Swell's especial functions and characteristics, present or to come; thirty years later, the Swell was assuming its own definite personality, distinct from the Great, but with its differentiation not yet fully complete.

The first phase, which culminates about 1840, is the extending and increasing of the flue stops into a balanced, light ensemble. This choice of date must not be understood to mean that every organ built after 1840 contained a complete flue-chorus in its Swell department; obviously no clear-cut dividing-line can be drawn in any gradual process of metamorphosis such as this was. But it is true to say that, by 1840, several organs were fully equipped from double to mixtures, on a distinctly lighter pattern than that of the Great flues; and thereafter, more and more builders began to follow the same path.

In the early twenties, tentative moves were made in the direction of additional unison stops (four at York in 1823, five at St.

Luke's, Chelsea in 1824), or additional mutations (twelfth and tierce at St.James', Bristol in 1824). The flue double appears at St.Peter's, Walworth, in about 1826; and there are also, regrettably enough, several Swells at this time which show a tendency to dispense with anything above the 4ft level. Brunswick Chapel, Leeds, for instance, despite having an interesting and varied collection of unison stops (or, more likely, because of it) can hardly have possessed an effective chorus with only a 16ft and a 4ft to supplement its five 8ft registers. Oldham Parish Church (1830) looks more promising, with a 16ft, three 8ft, a 4ft and a three-rank mixture: quite a model design, in fact !

Nevertheless, most Swells during the ensuing few years show no startling advance on eighteenth-century design. The 1834 Birmingham organ initiates further progress, with its six flue-stops from double to fifteenth, and there is a similar design at Trinity College, Dublin, by Telford in 1838. Two years later, Hill's unusually large two-manual of thirty-six stops at St.Peter's, Cornhill included twelve flue-stops on the Swell, from 16ft up to five ranks of mixtures. The Swell is beginning to sparkle at last !

A few words must be said here about the Swell reeds up to this point; it will be recalled that the average reed constituents of the Swell in the first quarter-century were hautboy, trumpet and occasionally clarion; and on the whole this state of affairs prevailed until 1841. There were a few exceptions, in the shape of a third (and in one case a fourth) unison reed, which may perhaps be interpreted as the first awakening of a realisation of the Swell's potentialities as a more predominantly reed ensemble, sometimes almost orchestral.

Some examples of these additional reeds may be quoted, as below; these, of course, were by no means all:-

St.James', Bristol (Smith,1824) — cremona (i.e.clarinet)
St.John's, Waterloo Road (Bishop,1824) — French horn
Brunswick Chapel, Leeds (Booth,1828) — cremona and cornopean
St.James', Bermondsey (Bishop, 1829) — French horn
Birmingham Town Hall (Hill,1834) — horn
York Minster (Hill,1832-3) — horn and cremona
St.James' Chapel Royal (Hill and Davison,1837) — French horn
St.John's College, Cambridge (Hill,1839) — French horn
St.Peter's, Cornhill (Hill,1840) — cornopean and tromba
St.Luke's, Manchester (Hill,1840) — cornopean

These various reeds were usually in addition to the standard oboe and trumpet, though at Manchester there was no trumpet. The encouraging fact that emerges from all these quoted examples is that builders are at any rate experimenting with different qualities of reed tone. Apart from the cremona (a stop of long standing, which is in due course destined to come to rest on the Choir or Solo manuals), there are four types of reed employed, beside the trumpet: French horn, cornopean, horn and tromba. The first of these is another veteran, dating back to St.Dionis Backchurch (Burney's first appointment) in 1724, but it does not long survive as a chorus reed. Instead, it develops into the ordinary non-imitative horn. Organ builders continued to try and capture the lovely tone of the orchestral instrument; but, as we are told

1) by Wedgwood, success was not achieved until the early years of the twentieth century, by the well-known contemporary builder John Compton.

The tromba, horn and cornopean have been widely adopted as chorus reeds, each with its own individual character, colour and function. The tromba is a powerful, smooth-toned trumpet stop, now more common on the Great; the horn is of larger-scaled pipes than the trum-
2) pet, and its tone is "fuller and smoother than that of the trumpet, and without the clang peculiar and essential to that stop." The cornopean has pipes of almost the same scale, and its tone is "more sonorous than
3) the trumpet; and smoother, though scarcely so powerful, as that of the horn." (Dr.Hopkins' usually careful sense of style has let him down here !)

The account of the Swell fluework, which paused on page 74, in 1840, now unites with that of the reeds. Hill's organ at Great George Street Chapel, Liverpool (1841) was complete in both departments, and to a remarkable degree too. A flue chorus from 16ft to 2ft (including quint and twelfth) capped by ten ranks of mixtures — a total of thirteen flue stops — and a six-stop family of reeds, comprising a double, four unisons and a 4ft: this was yet another of William Hill's strokes of genius. Indeed, it is a very moot point whether British organ-building does not owe more to Hill than to Henry Willis. Most writers on the general history of the organ, in dealing with nineteenth-century Britain — superficially, in nearly every case — take the line that nothing

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1. Wedgwood, op.cit., p. 76
2. Hopkins and Rimbault, p.144
3. ibid.

outstanding in the field of tonal improvement happened prior to Willis' Exhibition organ of 1851. It is hoped that this chapter will succeed in demonstrating what a misinterpretation of the facts this viewpoint is. Hill was really a far greater figure than is generally acknowledged; he was indeed the pioneer who found the trail and blazed it clearly for those who came after him; Willis, and others, widened, levelled and paved the final highway. As the century unfolds, Willis' particular genius (which was beyond dispute) will be found to lie in the direction, not so much of actual improvements in tonal design, as of improvements in voicing and mechanism.

The next few years, between 1841 and 1850, witness an increasing number of Swells on the Liverpool design; and what is especially significant is the way in which the reed-chorus is rapidly overhauling the flue-chorus in importance. The flue-work had been in existence, in its complete form, for fifteen years before the final steps were taken to make the reed section a balanced entity in 1841; but in less than a decade after this the reeds have so established their value as an integral part of the design that even moderate-sized Swells of ten stops are found to include four reeds, (16,8,8,4ft) almost as a matter of course.

Hill himself was the first to repeat his Liverpool Swell, in the year 1844 at All Saints', Northampton — fourteen stops, including five reeds; and the enterprising Nicholson of Worcester had a very interesting fifteen-stop Swell in the Shire Hall of his native city in this same year. The Worcester Swell contained gambas at 8ft and 4ft pitch, and the keraulophon (a quiet and slightly "horny" stop of the dulciana type) which had made its debut a year earlier at St.Paul's, Knightsbridge, in the new instrument built by the inventors of the stop, Gray and Davison. Another fairly constant member, since the later thirties, had been a 4ft flute, which had appeared in most swells of at least moderate size, under the names of suabe flute, wald flute or celestina.

In 1847, Hobson at St.Michael's, Chester Square, had a well-balanced twelve-stop Swell (the same number as was to be found twenty-five years later in the most perfect of all Swells at St.Paul's Cathedral): and Hill at Westminster Abbey in 1848 had an even more compact design of ten stops, with complete flue and reed choruses of six and four stops respectively -- what would be described in the current catch-phrase of organ-writers, as a "multum in parvo" scheme. In 1850, there were two more of these ten-stop Swells, which must have been very effective: by Gray and Davison at Boston Centenary Chapel, and by Willis at the Manor Chapel, Bermondsey,[1] which was his first organ of any importance (as distinct from rebuilds such as Tewkesbury and Gloucester). It is noticeable that practically all the Swell double reeds are styled "contra fagotto", showing that builders were aiming at a different tone quality from the Great double trumpet -- something quieter, something to produce a contrasting type of reed ensemble; though the final climax of Swell

1. This organ was originally erected in the Surrey Chapel, and later transferred to Bermondsey.

design was to be reached with the advent of heavy-pressure reeds, differently voiced from those of the Great, but often no less powerful.

The "English full Swell", then, has reached almost its full stature during little over twenty years of growth. What does it still lack before it can reach the peak of attainment where Willis' 1872 Swell at St.Paul's Cathedral reigns in unsurpassed majesty ? The one remaining ingredient, higher wind-pressure for the chorus-reeds, was Willis' principal contribution as far as exploitation and improvement and ultimate perfecting was concerned; and Chapter Three will have a good deal to say about his work, and about the question of heavy wind pressures in general.

But yet again, Hill was the actual innovator; and the first heavy-pressure stops were those which he installed at Birmingham and at York in the thirties. The honour of priority is not quite certain; the Birmingham tuba, which was on the Swell on a wind-pressure of eleven inches, has usually been declared the original by Hopkins and others following him. But there is clear evidence that the stop was conceived at York; and thus it is very reasonable to suppose that genesis followed conception in the same city, and that the stop first exercised its powerful infant lungs on Dr. Camidge's Swell. The story of the tuba's origin is amusing as well as historically interesting, and is supported by evidence not known to Hopkins. Incidentally, this stop has for most of its lifetime been regarded as part of the Solo department; but as its two earliest ancestors were on the Swell, their origins may relevantly be discussed here. The tale is told in a letter from John Camidge, a grandson of our hero of York, and himself organist of Beverley Minster, where he had occupied the post for over fifty years at the time of writing this letter (1930). He writes:

1) "My father used to tell the story of the tubas thus: Hudson, the railway king, a native of York, was a guest of the Dean one eving at dinner, as was also my grandfather, Dr.Camidge; and, as the latter never missed an opportunity of obtaining gifts for his new organ, got the railway king interested enough to say he would like to do something for it. Now, you will remember that when the old coaches, for which York was a great centre, set off on their journeys it was customary for the guards to play a stave or two such as 'Over the water to Charlie' on their coach horns; and, the new railway trains being very much on the principle of the coaches, Hudson had fitted some reeds on steam pressure for the engine-driver to 'tootle' before the trains left the station, after the coaching manner; but the passengers, instead of taking their seats, stood on the platform listening with delight, so the performances were discontinued. My grandfather thought a splendid effect could be produced by such powerful reeds on the Minster organ to top up the mixtures, so Hudson gave the money for them and the action, which cost £250.........."

At York, the Tuba Mirabilis organ, as it was called, consisted of the two stops Grand Ophicleide 16ft and Cornopean 8ft. These were on

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1. Letter to R.Meyrick-Roberts, published by the latter in Org.3.104.

a wind pressure of twelve inches, and were enclosed in a separate box,
1) originally, on top of the Swell-box, and played from the Swell keys. The allocation of seniority is of no great importance; these two organs were both the work of the same builder, and as we have already seen they were exact contemporaries in that their construction-dates coincided. And there, with the scales slightly weighted in York's favour, we may leave the question.

The reader will remember the many and various compasses which were in use at the beginning of the century — ten, at least, with the Tenor F and Fiddle G compasses in the ascendant. During the period covered by this chapter, there were still as many as nine different keyboards at one time or another, but the main struggle for supremacy lay between the Tenor C and 8ft CC compasses. Just as the Great was in process of being shortened from GG to CC, so was the Swell moving downward to meet it. By 1850, honours were even between the Tenor C and CC Swells.

The now familiar Smith-Hodges organ at St.James', Bristol, had a CC Swell as early as 1824, though its upward range was four octaves only (49 notes). Brunswick Chapel, Leeds, had a CC-F 54-note compass in 1828, as also did Birmingham Town Hall in 1834. The "second York" organ had a full five-octave Swell from CC, the first example of this complete range. (It will be recalled that this organ had a 16ft CCC compass for its Great and Choir.) The York compass, on all manuals, was reflected in Smith's Bath Abbey instrument in 1835.

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1. The organ in St.David's Cathedral (Lincoln,1843) had its Great 4ft Wald flöte and 8ft Posaune on a separate heavier-winded soundboard with a mechanical device for transferring them to the Swell keys. (Org.21.2, but wrongly dated. Correct date in Org.32.49, and in Hopkins and Rimbault, p.557.)

Hill established another "first" at St.Peter's, Cornhill in 1840. Here, both Great and Swell were from CC to F, 54 notes; and he adopted this as standard procedure from now onwards. Gray and Davison were the next to bring their Great and Swell into uniformity from CC to F, in 1844 at St.Luke's, Old Street; and others followed swiftly. Telford extended his manuals up to the full five-octave range at Radley College (1848); but in general the 54 notes up to F and the 56 up to G remained the normal upward range, with one more exception in the three five-octave CC-C manuals at Buxton Road Chapel, Huddersfield, in the year 1850.

In view of twentieth-century controversies over "total enclosure", it is of interest to observe that there was one instrument during this period which seems to have been enclosed in a general swell, namely Bishop's 1833 rebuild of the Norwich Cathedral organ. Our information on this comes from a local newspaper's account of the opening ceremonies; and the report appears to be so well-informed and so accurate on technical points (as if the information had been supplied by the builder himself) that it is difficult to find reasons for doubting that there was indeed a general swell at Norwich — except for the fact that Hopkins and other writers make no mention of it (not that this constitutes a very valid objection) and that all traces of its existence or of the manner of its removal have been lost.

Moreover, there is at anyrate one precedent for total enclo-

1. "Norwich Mercury", January 11th, 1834: quoted in Org.14.69

sure, in Green's organ at St.George's Chapel, Windsor, some forty-
1) three years earlier, where the general swell-box was still in existence at the time of Bishop's believed Norwich example and for three years thereafter.

The Choir Organ

The picture presented by the Choir organ during this period is in rather sorry contrast to that of the manuals above it and the pedals below. Whereas the other departments of the organ seem to be following a logical and purposeful pattern as they grow in size and power, the Choir is entering upon the "facilis descensus Averno", the downward path which in due course reaches its lowest level in that amorphous
2) cluster of registers which constitutes the average Choir organ for the rest of the century. The word "amorphous" is used here with literal intent, as the weaknesses in design were due to a recession away from this department's original function and towards the dimly-felt objective of some kind of Solo section; the change of shape was, however, not carried to its conclusion. The arrival of the fourth manual took care of the solo aspirations, and the Choir remained neither the one thing nor the other -- a formless department.

It might be argued that, on a three-manual at least, there is some justification for the Choir's being designed as a dual-purpose manual; this is admitted, providing that the two aims are thoroughly und-

1. cf. p.17
2. The next chapter will show a slight improvement in the sixties and onwards among a small number of Choir organs; but they are only a minority, and the improvement turns out to be only temporary.

erstood and fulfilled by the designer. More often than not, however, the result is failure on both counts, and it is not until the twentieth century that there is a general clarification of ideas on the subject. In any case, this argument does not excuse such a hybrid department on a four-manual organ; yet that is what one finds again and again during the nineteenth century.

During the period of the present chapter, the number of stops increases from the six-stop average of Chapter One until in the forties ten to twelve stops are by no means uncommon. One of the limiting factors previously, of course, was the purely physical one of space; the Choir pipework had to be confined within its own small case suspended below the main case on the screen in the older cathedrals and collegiate churches, or on the west gallery in most parish churches. Now, more space was available in the new type of concert-hall organ, or in the parish-church organ newly migrated to its organ chamber in the chancel — which, it may be pointed out, was often unsatisfactory acoustically and inadequate in size: but, at least, the Choir was able to take its share of whatever space was provided, without necessarily having to be cut down at the demand of architect and casemaker. Consequently, the general growth which has been observed in the Great and the Swell was also apparent in the Choir.

Unfortunately, though, this expansion affected principally
1) the unison and 4ft stops; and the tendency for the upperwork to disappear,

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1. cf. p.55.

which began to show itself in Chapter One, becomes still more marked. Mixtures very nearly die out altogether, occurring in only five per cent of the specifications of this period; and even a 2ft stop is far from universal. There is only one example of a flue double of full compass; and a handful of tenoroons. The reed is almost invariably the cremona, sometimes divided and with its bass portion labelled bassoon; and occasionally itself christened clarinet or corno-di-bassetto, but the stop is always the same.

To proceed to particular instances, the 1823 York organ is, surprisingly enough, hardly above the normal size for Choir organs of its date, with eight stops, including a sesquialtera; Dr.Camidge seems to have concentrated his interest on Great and Pedals only. The organ at St.James', Bristol, so advanced in other departments, has merely a little five-stop Choir up to 2ft and without a reed. St.Stephen's, Walbrook, exhibits embryo-solo tendencies with a French horn and vox humana. Brunswick Chapel, Leeds, in 1828 has both flue and reed 16ft stops — an important advance — but the fluework goes no higher than 4ft, so that much of the improvement to be expected from the presence of the double, must have been lost.

Choir organs remain at about six to eight stops during the next few years; even the Birmingham organ of 1834 is utterly conventional in this respect, though the "duplexing" of the entire Choir onto the fourth manual will be commented upon later in this chapter. The "second York" organ has five unisons on the Choir, including a newcomer named "horn diapason", but there are only two 4ft stops and one 2ft on top of all this unison tone. The twelfth puts in a very rare appearance on this manual at Bath Abbey in 1835; and this dwindling of the higher ranks is the clearest symptom of the Choir's abandonment of its original function as secondary Great; in this role, a partial flue-chorus cannot but be of merely partial value.

St.Luke's, Manchester (1840) had a Choir which was above the level of its contemporaries, with four 8ft, three 4ft and two 2ft stops, including a flute ensemble 8-4-2ft as well as the usual open diapason and its satellites. Insofar as any formal plan may be said to have emerged from the Victorian Choir organ, this flute-chorus became a fairly common feature of the more complete organs from the forties onward. The 4ft oboe flute, another invention of Hill's, was to be found in a number of his Choir departments at this time. Wedgwood describes it as a delicate flute "of small scale and slightly stringy tone." 1)

One of the very rare Choir mixtures was installed (or, to be more precise, allowed to remain) at Southwark Cathedral in the 1841 rebuild; and the man responsible was, of all people, Bishop — whose name is so closely linked with the policy of reducing the higher ranks of harmonics. However, he was no fanatical extremist, and he was well enough aware of what was required in a balanced manual department. The Southwark Choir was, in fact, a survival of the eighteenth century, and was exactly (apart from mechanism) as Byfield had left it in 1764;

1. Wedgwood, op.cit., p.115

Bishop deserves credit for resisting all temptation to add another open diapason, a clarabella and a couple of dulcianas, as well as removing the mixture and the fifteenth; for that is just what many another contemporary builder might well have done.

There are two points of interest in the "second Birmingham" Choir: the three unison stops are topped by as many as four of 4ft, including three flutes, and a fifteenth. It is diverting to notice that Hopkins, writing not many years after the period of this chapter, in-
1) veighs against the "excessive thinness, in spite of its sprightliness" of such a design. He continues:

> "The attributes for a Choir organ are lightness and variety, rather than fulness and power; hence a given number of stops, that would in the case of the Great organ require a twelfth and a compound stop, neither call for the one nor the other when appropriated to the Choir organ. A good number of 8 and 4ft stops, comprising delicate accompanimental and Solo stops, are among the first that should be selected for this department."

Thus Hopkins, in the early fifties — arch-advocate of the hybrid Choir ! This paragraph, from the most influential "best-seller" in all organ literature in English, must bear a heavy share of the responsibility for the sins and shortcomings of this section of the organ for many years to follow its publication. The phrase "accompanimental and solo" will not have escaped the reader, nor the dismissal of mutat-

1. Hopkins and Rimbault, pp.263-4.

ions and mixtures. Hopkins will not countenance a quietly-voiced higher
1) rank — on the grounds that, "while it certainly had the effect of producing a more equally balanced Choir organ, at the same time brought in the chamber quality." (This chamber quality has already been somewhat scathingly rejected by Hopkins as being "of little use for church purposes" when a Choir organ is "voiced with the delicacy of a Chamber organ".)

One final quotation: referring to "some of the best old instruments which still remain: not indeed that the Choirs of these organs present good models for imitation; for they are, or were, in their original form, very much out of proportion." Hopkins was, in many ways, a true "child of his time".

Birmingham was also unusual in having a cornopean as its Choir reed; this would certainly have far more value than the clarinet as a complement to a fairly bright flue-chorus; and in a four-manual, such as this was, there was no point in having a solo reed on the Choir.

A significant new aspect of the Choir's tonal design was the first appearance of string tone, in Hill's 1843 organ for the Edinburgh Music Hall: a salicional and a viol di gamba (as it was so often and so incorrectly styled: but then, one must not start picking holes in English stop-nomenclature — that would require at least a chapter to itself.) In the same year, Gray and Davison produced their prototype keraulophon at St.Paul's, Knightsbridge, which was another of the rare

1. ibid.

Choirs to possess a mixture.

Hill's otherwise outstanding instrument at All Saints', Northampton (1844) has to be content with the most ordinary of six-stop Choirs; but a much more promising design formed part of the Worcester Shire Hall organ of that year, where the eleven Choir stops comprised five unisons, three 4ft, a 2ft and a five-rank mixture (echo cornet) with a trumpet as the reed. This flue chorus had the elements of diapason, string and flute (two varieties of the latter); it had adequate upperwork and the right type of reed. Here was something approaching a secondary Great — the "ruckpositiv" which should be the pattern of this department.

Occasionally in the forties, the Choir contained the bottom octave or octave-and-a-half of bourdon or double diapason pipes. This, of course, is the fatuous tenoroon device again; it is unnecessary to comment on the musical effect of the right hand playing in "close harmony" while the left hand supplies a pseudo-pedal two octaves below. Bishop, Bevington and Gray and Davison were all guilty, at least once, of thus contributing to the retarding of pedal-development, respectively at St.Mary's, Clapham (1845), Cashel Roman Catholic Cathedral, Ireland (1846) and St.Chad's, Shrewsbury (1848); though the last-mentioned firm did something to erase this blot on their record, by building one of the better Choir organs of the period in 1850 at Boston Centenary Chapel — twelve stops, up to mixture, with the three diverse flue elements of diapason, flute and string nicely balanced.

Concerning the compass of the Choir, there is not a great deal to add to what was written about the Great, since in the majority of organs the two manuals remained, as they always had been, identical in compass. Between 1844 and 1850, however, there were five exceptions to this rule, and all of them occurred in important cathedrals; nor is it always easy to understand why this discrepancy in compass was allowed to arise, especially in view of the fact that it resulted in all three of the manuals having a different range.

In 1844, Bishop's rebuild at Durham Cathedral left the old Choir GG compass as it was, but altered the Great to CC and the Swell to Tenor C. In the same year, Gray and Davison's new organ at Chester Cathedral (in place of the old Father Smith and Snetzler instrument which went to Valetta Cathedral, Malta) had a similar trio of compasses, except that the Swell was Tenor F. Willis' Gloucester Cathedral rebuild of 1847 — his "stepping-stone to fame" as he referred to it towards the end of his long life some fifty years later — provided a CCC Great, a CC Swell and yet a GG Choir. The Westminster Abbey organ, extensively rebuilt by Hill in the next year, was exactly the same as Gloucester; and finally St.Paul's Cathedral, after the Bishop rebuild of 1850, possessed a CCC Great, a Gamut G Swell and a FFF Choir.

Of these five, the Chester organ was completely new, and so its choice of compass is particularly hard to explain. Nor can the other four be ascribed entirely to the rebuilders' having scrupulously preserved the compass of the original organs, because we know that the Great and

Swell were thoroughly altered, in one direction or the other, on all these instruments. Why, then, was the Choir kept distinct from the compass of the other two ? Why was the historic community of compass with the Great allowed to lapse in these important organs ? Was it just another symptom of the apparent uncertainty of purpose and definition which hampered the tonal development of this department, or was there in all these cases some explanation such as Willis offered long afterwards concerning the Gloucester organ ? The organist at the time of the rebuild was John Amott, predecessor of S.S.Wesley, and Willis in later years wrote as follows:

1) "Time has shown that it was quite wrong to extend the compass of the manuals..........I did this in 1847 under the dictation of Mr.Amott, and under protest, and therefore in any alteration of the work this encumbrance should be cleared out and a pedal organ of several stops be constructed to compensate."

It must be borne in mind that Willis was, in 1847, a young man of twenty-seven with his reputation still to be made. At such a stage in their careers, aspiring organ-builders do well to swallow their principles — and their wrath — and refrain from crossing swords with eminent Cathedral organists, however misguided. We know what would have been the result of a similar encounter twenty years later, if one could imagine any organist being so bold as to take issue with Father Willis in his prime.

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1. Letter quoted posthumously in "Musical Times",July 1905.

PLATE IV.

Brunswick Methodist Chapel,
Leeds.

This organ was one of the first in the Methodist Connexion (it was only in 1820 that the Conference decided that organs could be allowed by special consent). Built by Joseph Booth of Wakefield, it was opened by Samuel Wesley in September 1828. Apart from its outstanding specification for that date, it was adorned by a case which Freeman refers to as one of the latest and best of the occasional really excellent cases which were still being built in the style of the great period of the seventeenth century, at a time when organ-cases in general had been steadily declining in beauty of design and skill of workmanship since the middle of the eighteenth century.

(Photograph from Org.14.173 — block lent by W.Hollings Smith)

The Solo Organ.

It will be remembered that there were at least two eighteenth-century organs equipped with a fourth manual — Salisbury Cathedral (1710) and St.Magnus, London Bridge (1712). There may have conceivably been others, but no trace or record of them has survived; and all the important organs built during the rest of that century were limited to three manuals only.

Over a hundred years were to elapse before another four-manual instrument appeared, at St.James' Church, Bristol in 1824. Dr.Hodges clearly had in mind Renatus Harris' Salisbury organ, in which the fourth manual, the "Second Great", consisted of thirteen stops borrowed from the Great. The Bristol organ's fourth manual was called the "Inside Choir" and contained five stops "by communication" from other manuals. Hopkins tells us that they came from the Great, but he must have overlooked the fact that two of them (flute 4ft and clarinet 8ft) did not exist on that manual, and presumably originated on Choir and Swell respectively.

The next traceable fourth manual was in St.Edmund's, Lombard Street, a London City church, in Bishop's organ of 1833. Again, the system that we now call "duplexing" or "borrowing" was used, but on a more elaborate scale than before; for this extra manual, whose actual title has not been preserved, acted on Great, Choir and Pedal organs. In other words, it was a forerunner of the "collective" or "coupler" manuals which were to become a standard part of the cinema organs and other all-extension or "unit" organs of the twentieth century.

Birmingham Town Hall also had a fourth "duplexed" manual, divided into two portions, "Solo Choir" of eight stops and "Solo Swell" of nine. This manual, in fact, comprised the whole of the Choir and Swell, except for the double dulciana and carillon on the latter. Curiously enough, when the heavy-pressure tuba was added in 1837, it was placed on the Swell keyboard; and in rebuilding the instrument in 1843, Hill kept it there, although he did make slight alterations in the "Solo Choir": incidentally the specification given by Hopkins, and retailed without comment by other writers on this organ, has several incompatibilities between Choir and Solo Choir.

Nevertheless, Hill was fully alive to the tuba's potential value as a solo stop, as he demonstrated at Great George Street Chapel, Liverpool in 1841; the fourth manual on this organ constituted the first real and independent Solo organ — a single tuba mirabilis. Modern designers might scoff at the idea of a Solo department with a solitary stop on it; but how many organists of to-day, if compelled to choose one stop only for their fourth keyboard, would not ask for a tuba ? And it would be difficult to condemn them for so choosing.

One other four-manual instrument was built in this period, and it belonged to neither category of Solo organ so far discussed. In 1844, Hill rebuilt the organ in the old Chapel Royal in Whitehall; that is to say, he added a complete new Swell, leaving the other departments tonally untouched. The old Swell became the new Choir, and the old Choir became the new Solo. There could not have been a better manifestation of the utter lack of collective plan or purpose in the Choir organs of this time, than that a group of stops which had been accepted as a Choir organ for the previous thirty years should, overnight, be reborn as a Solo — and this, too, at the hands of the greatest and most progressive organ-building genius of the first half-century.

Mention has already been made (footnote, p.81) of Lincoln's remarkably "modern" device for providing a Solo department on a two-manual organ at St.David's Cathedral in 1843; two of the Great stops, on a separate soundboard and increased wind-pressure, were fitted with a mechanical contrivance which transferred them to the Swell keys. The present-day descendant of this ingenious idea, is the accessory stop "reeds on choir" with which so many three-manual organs are equipped, enabling the Great heavy reeds to be used as solo stops against the accompaniment of the Great fluework.

<u>The Pedal Organ.</u>

It was undoubtedly in this department that the most outstanding progress was made during the century's second quarter; the Pedal organ became, by 1850, an independent group of recognised and increasing importance, where only thirty years earlier we find occasional ranks of "pedal pipes" amid a forest of "pull-downs". This chapter takes us up to the point where the 29-note and 30-note pedalboards are practically universal on new organs of any repute, with as many as six or seven stops of full compass. The question of compass is so closely bound up with the Pedal organ's development that it will, in the following paragraphs, be discussed side-by-side with the various advances in tonal design.

York Minster is once again our first witness; in 1823, Ward and Dr.Camidge between them evolved a Pedal organ which was quite staggering for its date; viewed against its historical background, it represents an almost unbelievably sudden step forward from the state of affairs recounted on pages 36 to 39. This York organ had no less than <u>thirteen</u> Pedal stops; and such a phenomenon of design can be explained, though its distinction not a whit diminished, by Camidge's having travelled on the Continent and made himself familiar with the Pedal departments of France and Germany. The compass was that of its period: one-and-a-half octaves from FFFF to Tenor C, being planned to lie an octave lower than the manual FFF compass, an arrangement which has always been the rule since then — with the C or any other keyboard.

The thirteen stops were disposed in two almost identical sections, inside and at opposite ends of the massive stone organ-screen, presumably with the intention of corresponding with the two parts of the divided Great. There were four flue-stops (two open, two stopped) and two reeds, all going down to FFFF 24ft; the remaining four flues and three reeds were of 12ft pitch, to FFF.

Dr.Hodges, of course, had a contribution to make — several, in fact. His Pedal organ at St.James', Bristol (1824) had a two-octave range, beginning at the self-same CCC which, after a short campaign, was to be established as the standard bottom note to this day; and containing five stops. This figure may seem almost disappointing after York, but it can be properly appreciated if set against normal contemporary practice of Hodges' own day; and the extension of range was a big advance in itself. The specification was one which few designers could condemn even now in a five-stop scheme: 32ft double stopped diapason (the first stop of 32ft tone in Britain, though the pipes were of 16ft actual length), 16ft open and stopped diapasons, 8ft principal, and 16ft reed (a bassoon). The pedal keys were of brass, Hodges' own invention; it was claimed for them that they were not so far apart as the wooden keys — two octaves of brass occupying less space than one-and-a-half of wood — but they were believed to have cost Hodges a fearful amount
1) in shoe-leather, and they were very seldom repeated elsewhere, except by Hodges himself when he migrated to America.

The first full-length 32ft open diapason was installed in Brunswick Chapel, Leeds in 1828, as part of a four-stop Pedal scheme — open diapasons of 32,16 and 8ft pitches, and a 16ft Trombone. The two-octave CCC compass was used here; but three years later we find an organ, by Bishop at St.John's,Paddington, whose Pedal range was "two-and-a-half octaves from CCC", which must mean one or other of the two

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1. In 1838, Joseph Monday (Smith's step-son and successor) added eleven open pedal pipes and new pedals capped with brass, at Bristol Cathedral.

modern compasses up to F or G. There was only one stop, a rank of "pedal pipes", but the increase in extent is an interesting feature, especially on a rather small two-manual such as the Paddington instrument was. But we have already noted that Bishop was far from being among the rank and file of organ-builders.

The "first Birmingham" organ (1834) had a two-octave CCC pedalboard, with four stops: two 32ft open diapasons in wood and metal, 16ft open wood and 16ft trombone. Its contemporary, the "second York", had a similar compass but with a larger group of stops — nine. This was less than the 1823 York pedal, but better planned, with none of the earlier reduplication. There were now three 32ft flues (open wood and metal, and stopped wood), and three 16ft open diapasons; the reeds were at 32, 16 and 8ft pitch. This was the first 32ft reed in Britain, and the 32ft open metal stops here and at Birmingham were also the first of their kind — and they are still in use to-day. The York
1) double reed lasted until 1903 before it was replaced: and the York 32ft open wood has partially survived. In its original form, it was
2) probably the largest-scaled stop ever to be made, with its diagonal measurement of four feet; the upper pipes have been lengthened to form the lowest notes of the present stop, thus reducing the scale considerably. It is easy for a modern critic to find faults with Camidge's design in the light of wisdom after the event and the accumulated experience of the past century — too much 32ft subunison tone,

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1. Wedgwood, op.cit., p.138.
2. ibid., pp.59-60.

too little variety among the 16ft flues, not enough 8ft; but historically it remains a marvellous achievement. It has been thought that the reader will be interested in the subsequent fate of Camidge's masterpiece before it moves out of the limelight: and a post-script to this chapter will provide an account of its decline and fall. One further fact of more than passing importance was that its pedalboard was one of the first two radiating (but not yet concave) boards in Britain, the other being by Bruce of Edinburgh at Mitcham Church in 1834.

A well-balanced Pedal scheme, which became almost a "standard model" in the next few years, was used by Hill at Great George Street Chapel, Liverpool, and at Stratford-on-Avon Parish Church, both in 1841. This consisted of six stops — open diapason, bourdon, principal, fifteenth, mixture and reed — and appeared again at Worcester Cathedral in 1842. Hill had a 27-note compass for the earlier two, and 29 notes at Worcester. All these, however, were thoroughly eclipsed in 1843 by the "second Birmingham" Pedal organ, with its fifteen stops and its 30-note CCC-F compass. Its design was admirable: two 32's, four 16's, 8, 5 1/3, 4, eight mixture-ranks, and reeds 32,16,8 and 4. Even at the end of the century there were not many pedal departments more complete or effective than this example from the eighteen-forties.

Hill's "six-stop model" was taken up by Gray and Davison at St. Paul's, Knightsbridge (1843), and he himself added an 8ft reed to it at All Saints', Northampton, a year later. This was the year in which Nicholson, at Worcester Shire Hall, used twelve Pedal stops, eleven of them flues forming a well-varied chorus from 32ft to mixture, including five different 16ft registers — large and small open diapasons, dulciana, violon and bourdon, followed by a quint, two 8ft's and a 4ft. Builders were now seeking variety of tone-colour instead of mere size: it was gradually being realised that every combination of manual stops required its own suitable bass.

Ashton-under-Lyne Parish Church (1845) received another example of the Hill six-stop scheme; he must have found it very effective to have made so much use of it — Hill was not the man to rest content with anything that did not satisfy him, and indeed it certainly was a very comprehensive design for its number of ranks. Telford, at Radley in 1848, made it up to eight by the addition of a "twelfth,2 2/3ft" (which is a misnomer on the Pedals, the more correct designation being octave twelfth or larigot) and an 8ft reed. Incidentally he inserted a 32ft four years afterwards.

Until now, the compasses had generally been either up to D (27 notes) or to E (29 notes), except for Birmingham. Telford's pedalboard, however, went up to G, as also did Jackson's eleven-stop Pedal of rather similar design at the Liverpool Collegiate Institution in 1850. This gave a range of 32 notes, and ir has become, together with the 30-note CCC-F compass, one of the two standards used to-day.

Gray and Davison, at Boston Centenary Chapel in 1850, achieved something very like a modern six-stop Pedal by omitting the mixture and substituting a bourdon — though one must remember that such a design in an organ of to-day would be swollen to twice that number of stops (apparently) by duplexing and extension: an excellent system in moderation, but sometimes carried to extreme lengths so as to conceal a miserable paucity of independent ranks behind an imposing array of drawstops or stopkeys.

As a final landmark in the Pedal's progress at this period, attention must be drawn to the Buxton Road Chapel at Huddersfield, where Robson's 1850 Pedal department of nine stops has an almost Continental air about it: six flue stops, from two 16's up to five-rank sesquialtera, and a trio of reeds at 16, 8 and 4ft pitches. This is definitely a recitalist's Pedal; its clarity and brilliance must have been a revelation. Furthermore, the 30-note range of its pedalboard was augmented by an additional octave of pipes on the sound-boards, in order to give maximum effect to the so-called "copula" or octave-coupler, which thus practically doubled the number of registers available.

It is only just — and historically necessary — to say something about the other side of the picture. Plenty of important organs continued to be built with only one Pedal stop, or GGG pedal compass, or both. A handful of notable examples chosen from among many in the forties may be quoted in illustration: Southwark Cathedral (Bishop, 1841); Halifax Parish Church (Hill, 1845); Durham Cathedral (Bishop, 1844); Chapel Royal, Whitehall (Hill, 1844); Christ Church Cathedral, Oxford (Gray and Davison, 1848); Willis' two early organs at Gloucester Cathedral and Manor Chapel, Bermondsey in 1847 and 1850; and finally Bishop's rebuild at St. Paul's Cathedral in 1850. Though the CCC compass was fairly firmly established, it still had some little way to travel before it could be called universal: and the Pedal department as a whole had not yet reached the point of being considered on terms of equality with the Great and Swell. Nevertheless, it had undoubtedly arrived !

One other "invention" of the period deserves mention, though it had no effect on subsequent organ development in the nineteenth century. The ingenious Dr. Hodges devised, and John Smith constructed, a polyphonic pedal-pipe, of the type which appeared in the Italian-built organ at the 1851 Exhibition, but which was not perfected until John Compton adopted the polyphone in the twentieth century. One such was incorporated in the organ at St. Mary Redcliffe, Bristol, in about
1) 1829. Hodges described the device as "on the flute principle...... in one of the sides of the pipe, apertures are cut, near which pallets or stoppers are affixed so as to cover or close them tightly. These pallets are respectively made to open upon the depression of their corresponding pedals, and to shut by means of springs or balance-weights when the pedals are released. In this there is, of course, a double action -- the wind-pallet or air-valve being opened at the same time that the tuning pallet is adjusted. This action, which would be

1. Quarterly Musical Magazine and Review, Vol.9 (1827).

too heavy for the fingers, is scarcely sensible to the feet."

However, Dr.C.W.Pearce, the eminent organ-historian, though
1) enthusiastic, was also realistic. "This clever attempt" he wrote, "to obtain several sounds from a single pedal pipe by boring holes in it -- as in a penny whistle -- and by stopping these holes with gigantic mechanical fingers apparently never got beyond its initial experimental stage. John Smith, organ builder of Bristol, made one such pipe, which produced, in the manner described, the four sounds C. C sharp, D and D sharp............Probably the mechanism was found to be too costly; and, what was even worse, the proper scale-proportion of the pipe was too much disturbed thereby."

Dr.Pearce has certainly hit the nail on the head in his last phrase; and it is no doubt for the same reason that to-day, even in the hands of such an artist as Compton, the polyphone has found its niche rather in small organs where space is at a premium (the "Miniatura" type of organ, for example) than in his many larger instruments where artistic considerations can have more weight.

The action.

It would be difficult to decide -- and perhaps not very profitable to speculate upon -- the most important invention in a century crowded with discoveries and innovations which had far-reaching effects upon design in organ-building and upon technique in organ-playing and composition. But we may go so far as to say that the

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1. "Musical Opinion", September 1926, p.1215.

"short list" for final selection, in reaching such a decision, would certainly include the lightening of the manual touch and the overcoming of the mechanical resistance of the action. Thereby the way was opened towards increased size, power and tonal variety, and the unfettered adoption of heavier wind-pressures. Unfortunately the precise allocation of credit for this invention is not easy; and any statue which might one day be erected to the Inventor of Pneumatic Action would require to have three heads growing, Cerberus-like, from its shoulders.

The first small step was taken by Joseph Booth, the Wakefield organ-builder whose masterpiece in Leeds' Brunswick Chapel has been several times referred to in these pages, and who there revealed himself to be well to the forefront of his contemporaries. In 1827, at Attercliffe Church, near Sheffield, he placed some of the wooden bass pipes of the Great organ's GG open diapason (some authorities say it was CCC) on a separate soundboard, and attached a small circular bellows, which he called a "puff", below the pull-down of each pallet. The bellows, when fed with wind by a conveyance from each pallet, opened downwards and pulled down the pallet with it; thus the player's finger did not have the resistance of the pallet-spring to overcome. The interesting fact about this action -- which Booth unfortunately did not develop, nor even mention until over twenty years later -- was that it had a much closer resemblance to the tubular-pneumatic action which Willis introduced in 1872 than to the pneumatic-lever which Barker and Hamilton brought out in the thirties.

Booth's "puffs", though first in point of time, were so limited in their application and so untested by actual experience, that it remains for Charles Spackman Barker of Bath and David Hamilton of Edinburgh to be the two rival claimants to the honour of having invented pneumatic action; and the balance of evidence seems to be weighted in Hamilton's favour, in that he undoubtedly fitted such an action to the organ of St.John's Episcopal Church, Edinburgh, in 1835, where-
1) as Barker can claim only to have announced his discovery — whatever it then was — in 1833; nor was it actually used in any organ until 1841, at St.Denis in Paris.

Barker has generally been given the lion's share of the credit on the strength of his own unsupported testimony quoted in Hopkins and Rimbault; but Bishop Wedgwood has brought forward some good reasons for questioning Barker's trustworthiness as a witness in his own defence. However, let Barker's words be first examined: they are worth reading if only for Dr.Camidge's vivid description of the physical difficulties of playing on such a large instrument as his own "second-born", which was then just recently installed. Barker's account begins thus:

2) "It was in 1832 that Mr.Barker, then established as an organ-builder in Bath — his native city — was led to reflect on the serious inconvenience arising from the extreme heavi-

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1. vide Barker's own account in Hopkins and Rimbault, pp.71-2
2. ibid. This passage is quoted at length, as Hopkins and Rimbault may not be available to the majority of readers.

ness of touch in all large organs, and as more particularly exemplified in the one then but recently constructed for York Minster Cathedral. His persevering studies having revealed to him an efficacious remedy of this defect, by the invention of what has since been called the pneumatic lever, he wrote in 1833 to Dr.Camidge, then organist of the Cathedral, announcing his discovery, and begging to be allowed to give a proof of its efficacy, by applying it in a temporary way to one of the heaviest keys of the organ. Dr.Camidge in his reply wrote: "To such an instrument as ours it (i.e. the discovery) would most certainly be very important, where four organs have to be played occasionally by one set of keys, and I should be most happy to recommend its adoption. Mr.Hill, of the late firm of Elliott and Hill, has erected our organ, and, I assure you, the playing it is no sinecure; on the other hand it is most laborious work to go through a grand chorus or last voluntary with the whole power of the instrument. Such a difficult touch as that of York Cathedral organ is doubtless sufficient to paralyse the efforts of most men, I assure you. I, with all the energy I rally about me, am sometimes inclined to make a full stop from actual fatigue in a very short time after the commencement of a full piece.'

"Notwithstanding Dr.Camidge's wish and recommendation, financial difficulties stood in the way of Mr.Barker's invention being adopted in York; nor was he more successful in his proposition for applying it to the Birmingham organ opened in 1834 or 1835. It was about this period that the eminent French builder, M.Cavaillé, was occupied in building a colossal organ for the royal church of St.Denis, near Paris, and it was already sufficiently advanced to convince Mr.Barker that, for heaviness of touch, it would rival or even surpass the York Minster and Birmingham organs in their then conditions; indeed, it might have been fairly questioned whether any organist of acknowledged talent would risk his reputation by attempting to play it.

"Mr.Barker heard from a friend who visited the Continent occasionally that such an instrument was building, and Mr.Barker wrote immediately to M.Cavaillé to propose the introduction of his pneumatic lever, accompanying his letter with a certificate from his since lamented friend Mr. Herrick, who had played on a small instrument Mr. Barker had fitted up for demonstration, each key of which presented a resistance of several pounds. This was in 1837. M.Cavaillé replied, engaging Mr. Barker to go over to France, and examine the possibility of applying his invention to the magnificent organ in question. Mr. Barker visited Paris, and the application was decided upon, under his immediate superintendence. However, in order to establish priority as inventor, and protect at the same time his interests, previous to doing anything more in the matter, he took out, in 1839, a French patent, and soon after the pneumatic lever was applied with the greatest success, and for the first time, to the St.Denis organ........"

To this may be added Barker's comments on Booth's claims to priority, a pleasant piece of witheringly-patronising prose:

1.) "Mr. Barker cannot, in this rapid and imperfect biographo-historical sketch respecting the pneumatic lever, pass over in silence the claims of priority which have been put forth by other parties to the invention. In the first place, that of Mr. Joseph Booth, organ-builder in Wakefield, and who, it is alleged, introduced a contrivance of this nature into the Brunswick Chapel organ in Leeds in 1827." (Barker is, as the reader is aware, mistaken here.)

"A small bellows, called a puff valve, is said to have been placed in connection with one of the double grooves of the sound-board, and by its inflation, on one of the pallets being drawn, to have acted automatically on the second. In suffering this description to be correct, there would be evidently here the germ of the pneumatic lever, as in the early trials of Papin was contained implicitly that of the steam engine, perfected later by Watt, Stephenson and others, but in the one as in the other case, how great the distance which separates the elementary fact from its ultimate results — how great the difficulties to be overcome. Free to admit that Mr. Booth was in possession of a fruitful idea, he kept his light so completely under a bushel that, sterile in its consequences, no one heard of it till twenty-four years after, when it had long ceased to exist. It is superfluous to say that Mr. Barker had no previous knowledge of this attempt or any other in the direction of his pneumatic lever, which, it is

1. Hopkins and Rimbault, pp.72-3.

well known, constitutes in the organ as constructed by him a motive power directed by the finger of the performer to all the mechanical parts of the instrument......."

1) Hodgwood suggests that Barker's proposals were rejected at York and Birmingham not so much on financial grounds as because his action at that time was a "thoroughly unworkable apparatus of piston and cylinder". Indeed Hinton, in his book "Organ Construction", tells
2) us that Barker's first experiments were derived from the idea of the hydraulic press, and that he devised a mechanism using the expansive power of compressed air. The only hint we have as to when Barker abandoned this line of research and began to use little motor-bellows
3) in his action is found in a brochure by Dr. Albert Peschard of Caen, an associate of his and one of the pioneers of electric action. According to Peschard, Barker's thoughts were turning in this direction about 1836. In any case we have seen that his French patent was not taken out until 1839: it is not easy to account for that lapse of two years from his first arrival in Paris, if he had crossed the Channel with his action already perfected. From France, the knowledge of his action spread to England, so that any subsequent attempt to take
4) out an English patent would have been, as Barker lamented, "only bringing coals to Newcastle."

Hamilton's installation of a complete pneumatic-lever intermediary action at St.John's, Edinburgh, is well-substantiated in a

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1. Org.14.49
2. Dr.J.W.Hinton, "Organ Construction",1902, p.4
3. "Application d'Electricite aux Grands Orgues",Caen,1865.
4. Hopkins and Rimbault, p.72

celebrated volume first published in London about 1840 and repeated in several later editions, the "Catechism of the Organ" by one James Alexander Hamilton — and suspicious readers may be assured that there is no evidence of any relationship ! The writer relates that

> "between 1835 and 1836 Messrs.Hamilton added a choir and pedal organ. The choir organ is in two halves, one on each side of the gallery, with actions upwards of 50ft long, and the touch of which is as light as a pianoforte."

1) Hopkins comments: "It is a pity, for his own sake, and for the sake of organ-building in this country, that he did not make his invention more widely known. In a letter written to Gray and Davison, the original of which I have been allowed to see, David Hamilton says that his apparatus was designed in 1835. The model apparatus made in that year......was shown at a meeting of the British Association for the Advancement of Science at Birmingham in 1839." This model may be seen in the Royal Scottish Museum in Edinburgh.

Thus the pneumatic lever (or "Barker-lever" as it was called because most of the examples in England followed Barker's French prototypes, not Hamilton's in Edinburgh) had overcome the prime disadvantage of tracker action, its heaviness of touch. No longer was it necessary for an organist to emulate the "pulsator organorum" of earlier centuries. But other drawbacks remained to this new action: its cum-

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1. Org.14.50.

1) brous awkwardness, the space it required, and the fact that the pipework still had to be concentrated in one mass with the console built into the casework, in order to avoid a multiplication of the complex wooden connections which still lay between key and pipe.

Nevertheless, there were a few examples of "long movements" or "long actions"; we must not yet use the term "detached console", as there seems to be no trace of the word "console" in its organ connotation of meaning before 1851. (There will be some discussion of this in the corresponding section of Chapter Three.)

The reader will have become accustomed to the York organ's appearance at the outset of most of the sections of this chapter: and indeed there are yet other astonishing facets of its character to be presented. A rare description of a Grand Musical Festival at York in 1823 relates that

2) "Mr.Ward, whose superior talents have brought the organ to its present state of perfection, undertook to overcome the difficulty, and though many doubts were expressed that from the extent of the requisite machinery the sound would not be sufficiently instantaneous for observing time, yet the effort was crowned with success."

The description went on to say that Ward constructed a set of keys one hundred and twenty feet from the organ.

"With this single set of keys, the organist was able to perform at pleasure on all, or any one, of the fifty-two stops contained

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1. The organ at St.Mary's, Taunton, by Ling of that town in 1842-4, was the first example of a divided organ; probably it was so arranged in order not to obstruct the west window.
2. Quoted by F.Bernard Goodman in Org.14.61.

in the nave, the choir and the great organs. The pedals were also brought into the same space."

The Metropolitan Cathedral of Canterbury now returns to these
1) pages after a lapse of more than eleven centuries. In 1827, the organ having been deemed an obstruction to the view of the vaulted ceilings from both choir and nave, James Longhurst removed the entire instrument from the screen to the triforium over the south choir aisle, with the keyboards immediately behind the lay-clerks on the decani side, that is to say down in the choir stalls on the south side. Communication from keys to pipes was provided by means of trackers, which ran in a trough under the floor of the choir aisle and up through a trench cut in the south wall of the aisle to the pipes in the triforium above, a distance of ninety-one feet altogether. This long action remained through subsequent minor restorations of the organ, until Willis' completely new electro-pneumatic instrument was erected in 1886.

Hill's Birmingham organ in 1834 or 1843 must have had a long action of some sort, though its distance is not recorded, because it is known that some modifications in 1849 included the abolition of "the very long and cumbersome action" and the application of pneumatics to the Great organ only. In 1839, J.W.Walker built a large instrument for London's Exeter Hall, in which "the keys are so arranged that the organist, when playing, faces the conductor and audience, instead of sitting with his back towards them." (In other words, this was a reversed console, such as is common on the great west-end organ

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1. cf. p.1

galleries of France.) Exeter Hall, like Birmingham, had "the Pneumatic action for lightening the touch" added in 1849, "the first instance of its employment by any of the London builders". If so, it can only have been a matter of months ahead of Birmingham, for Hill also was a London builder.

For the occasion of Queen Victoria's marriage in 1840 in the Chapel Royal, St.James' Palace, a long movement was added in order to bring the console to the edge of the gallery temporarily erected in front of the organ. Freeman, in relating this, adds: "They were fond of long movements in those days, and, it should be added, adepts at fitting them to existing organs when occasion arose."[1] One hesitates to question the words of the greatest of British organ-historians, but this does seem to savour of exaggeration for the sake of effect. In fact, long actions were few and far between — and were bound to remain so, as long as mechanical action survived.

This section may be closed with one more "royal" example — at Windsor Castle. In 1841, Gray's rebuild of Samuel Green's organ (not in the Chapel, but in the Music Room, i.e. St.George's Hall) had a long movement of over 22ft, so that the band could be seated between the organist and his instrument.

Mechanism and Controls.

(a) Couplers. The cloud of uncertainty obscuring the very important field of "aids to registration" earlier in the century, is now dis-

1. Org.4.177

pelled; and the fact that every specification which has come down to us, from the year 1825 onwards, does in fact include details of couplers, while those prior to that date make no mention of such things, can only strengthen the conclusion that they did not begin to come into regular use before the twenties of the nineteenth century. From 1825, however, couplers form part of every new organ; and, as we have seen, they become one of the contributory factors to hasten the invention and adoption of the earliest pneumatic actions.

At first, the standard couplers were Swell-to-Great, Great-to-Pedal, Choir-to-Pedal and Choir-to-Great. Often these stops were labelled in what we should now term the reverse order, i.e. Pedals-to-Great and so on. The Swell-to-Pedal, of course, could not be introduced until the compass of that manual was extended downward to CC, after which it became more frequent; the only early examples of this were at York (1823) and Birmingham (1834). Strangely enough, St. James', Bristol, despite its CC Swell, did not have this coupler, though it had the then unusual Swell-to-Choir and the even more novel Swell-Octave-to-Great. The latter stop made its next appearance in the "Second York" organ, and Dr. Camidge commented that it gave "considerable brilliancy to the instrument". It remained, however, a very rare coupler.

Another type of inter-manual octave coupler was used for the first time in 1834 at St. Dunstan's, Fleet Street, by Robson. This was the Choir-to-Great-Suboctave, which occurred again later in

Hill's Halifax organ (1843) and at the Collegiate Institution, Liverpool (Jackson, 1850).

A coupler which must have been especially useful in view of the straitened resources of the pedal department, was the "Octave Pedal" or Pedal superoctave coupler, of which the first traceable example is in Gray's rebuild at Exeter Cathedral in 1838. Thereafter it was included in a number of organs, sometimes under the name "Copula". There were at least two organs in which the pedal soundboards were carried up an extra octave in order to make this coupler effective throughout the whole compass of the pedalboard: these were the 1838 Coronation organ temporarily installed in Westminster Abbey (and afterwards moved to St.John's, Chester) with its three pedal stops, built by the short-lived partnership of Hill and Davison; and the 1850 Robson organ, with nine Pedal stops, at Buxton Road Chapel, Huddersfield. This coupler, with its extra octave of pipes, was practically equivalent to doubling the number of stops in the Pedal department.

An interesting experiment was tried by Holdich in one of his earliest instruments, a two-manual at Rodenhall in Norfolk (1843.) The Pedal organ here had only one octave of pipes, from 16ft CCC upwards. The Tenor C Swell was permanently coupled to the Pedals, and possessed an additional two stops, "Bourdon Choir" and "Stopped diapason Choir", which spoke in the bottom octave only, from CC to Tenor C. Their function was to supply a soft pedal bass, and to augment the Pedal tone in that lowest octave up to the point where the Swell "joined in". This arrangement may not have been of any historical importance, but it is interesting in that it shows a laudable attempt on the part of a man who became one of the most active advocates of Pedal-organ development, to provide some kind of varied and suitable Pedal bass for the manuals in a small organ where resources were doubtless insufficient for full-sized independent ranks of Pedal pipes.

Worcester Shire Hall (Nicholson, 1844) had a coupler called "Pedal organ, off or on", or as we should now say, "Pedal unison-off". This is a stop which has not proved its value in the light of experience; even among the dozens of couplers which electric action permits a large instrument to have nowadays, the Pedal unison-off does not find a place — though one can conceive uses for it in an organ possessing a "Pedal Octave" coupler and the all-important extra octave of pipes. It is not known whether the Worcester instrument had these pipes: it certainly had the octave-coupler.

Nicholson provided another valuable novelty in this organ, in the shape of a "Swell octave-coupler"; and at this point a little obscurity must be cleared up regarding the first use of this stop in England — the first, that is to say, since Harris and Byfield's "spring of communication" at St.Mary Redcliffe, Bristol, in 1726. This obscurity has arisen from loose and ill-defined use of such terms as "Octave manual coupler", "terzo mano" and "Diacoton", mainly by Hopkins. He tells us that what he calls an "octave manual coupler" was introduced into Smith's Bristol organ in 1824; and goes on to say,

1) quite correctly, that this coupler "unites the Swell to the Great Organ in the octave above." However, Hopkins then proceeds:

> "Octave couplers are frequently found in the organs of Italy, where they are called Terzo mano, third hand. In England, this kind of coupler is called by the organ-builder who re-invented it — for Mr. Holdich does not appear to have been conscious of its pre-existence elsewhere — the Diaocton."

Where Hopkins misleads is in his clear implication that the Bristol coupler was an instance of the Terzo Mano or Diaocton; and it is no doubt this passage which has led Wedgwood to write, in defi-
2) ning the Diaocton, "the name given to the octave coupler by Holditch, who appears independently to have invented it, though long, of course, after its first employment in Italy, and subsequent to its introduction at St.James' Church, Bristol (Smith,1818)". (Wedgwood is wrong in his date, as well as in his spelling of Holdich's name.)

The truth of the matter is that, whereas the terms Terzo Mano and Diaocton refer unmistakably to an "Octave coupler" in the accepted modern sense, the Bristol stop did not fall into this category, and was in fact an "Intermanual octave-coupler". Its nature is clearly established by the previously-quoted correspondent in the "Harmonicon" for December 1824, who describes one of the "connecting stops" as being "for uniting the Swell an octave above with the Great Organ."

Further light on Holdich's apparent claim to have invented

1. Hopkins and Rimbault, p.55
2. Wedgwood, op.cit., p.48

something which had in fact existed previously, is thrown by Andrew
1) Freeman, in writing about the "diaocton stop, a coupler that acted through the entire compass, including the top octave, hence its name. It is curious how few people seem to have realised that Holdich did not claim to have invented the octave coupler, but only to have improved upon it. The extra octave of pipes at the top was a most valuable addition."

Thus the palm must be yielded to Worcester for the first nineteenth-century octave coupler on the manuals. Others to follow Nicholson's lead very soon were T.C.Bates (St.Martin's, Ludgate, 1848) and Jackson (Preston Parish Church, 1850).

This terminological confusion makes it not inappropriate here to add support to Wedgwood's comment on the nomenclature of couplers.
2) He refers to the "terminology usually employed" (i.e. Swell to Great Suboctave, and Swell to Great Octave) but stresses that he must "express his strong preference for the style: Swell Suboctave to Great, Swell Octave to Great — as being more lucid." Wedgwood is quite right: but a great many people connected with organs adhere to the ambiguity which Wedgwood seeks to avoid. Lucidity and the logical expression of thought are not always the strong points of such folk; and the decline of these qualities is coincident with the decline of that classical upbringing which breathes through every word of the writings of Wedgwood himself, Andrew Freeman, J.H.Burn, of Bonavia-

1. Org.23.89
2. Wedgwood, op.cit., p.33n.

Hunt, Gordon Paget and Bernard Edmonds, and makes them so delightful and withal so limpidly instructive. There are others, no less skilled in the theory and practice of the organ, whose writings repeatedly cause discomfort to the diminishing number of those who still care for the English language, and whose infelicities (to put it politely) of style detract considerably from the value of what they are trying to say.

Other new couplers to appear during this period may be mentioned briefly. The Chapel Royal, Whitehall (1844) had one which Hopkins describes as "Swell-to-Choir, octave below" — presumably this is the "Swell Suboctave to Choir" but Hopkins has given us another little argument in support of Wedgwood's plea for clarity of label. In the same year, St.Luke's, Old Street had both Swell-to-Great-octave and Swell-to-Great-suboctave, the only example of this latter coupler before 1850, though the former is found in a number of instruments. But anyone who has played a large tracker organ (and it is now almost a proof of middle-age to have had this experience) with even one manual coupled to the Great, will find his imagination boggling at the thought of Swell coupled to Great at no less than three different pitches, and will feel no surprise that organs were thus equipped very, very seldom.

On the longer-compass GG, FFF and CCC organs, the pedals were sometimes coupled to the manuals in two pitches, 16ft and 8ft; for instance, at Gloucester in 1847 there were two couplers designated "Pedals to Great", which Freeman conjectures as being at these two different levels. Westminster Abbey (1848) had Great-to-Pedal 16ft and Great-to-Pedal 8ft; and the Temple Church, in the following year, had an "8ft pedal register" and "16ft pedal register", to be used in combination with the Great-to-Pedal or Choir-to-Pedal couplers, neither of which operated unless one or both pedal registers were drawn.

A unique coupler, but one which indicates definite enlightenment of outlook in its designer, was the "Canto fermo coupler" fitted to the organ in Trinity College, Cambridge in 1836 at the request of Dr. Walmisley. This coupled Choir to Pedal at 2ft pitch, two octaves above the unison. Clearly Walmisley did not think of his pedal department as existing only to provide a "drone bass"; it had its melodic function, and one could almost name the particular Bach chorale-preludes which he had in mind in planning this stop.

There were also to be found, on occasions, some couplers which seemed to foreshadow the modern "floating department" coupler. We are accustomed nowadays to stops like "Bombarde on Choir", "Echo on Swell", and so on; Dr.Camidge at York in 1823 had at his disposal "East Great to Keys" and "Nave Great to Keys". The 1843 Birmingham rebuild had couplers marked "Solo Swell" and "Solo Choir" — doubtless for the purpose of making one or other of these two duplexed departments individually available on the fourth manual. St.Olave's, Southwark (1844 to 1846), which will be remembered for its remarkably large Great, was equipped with a coupler "Grand Organ combined" to unite the two separate soundboards of the so-called Grand manual.

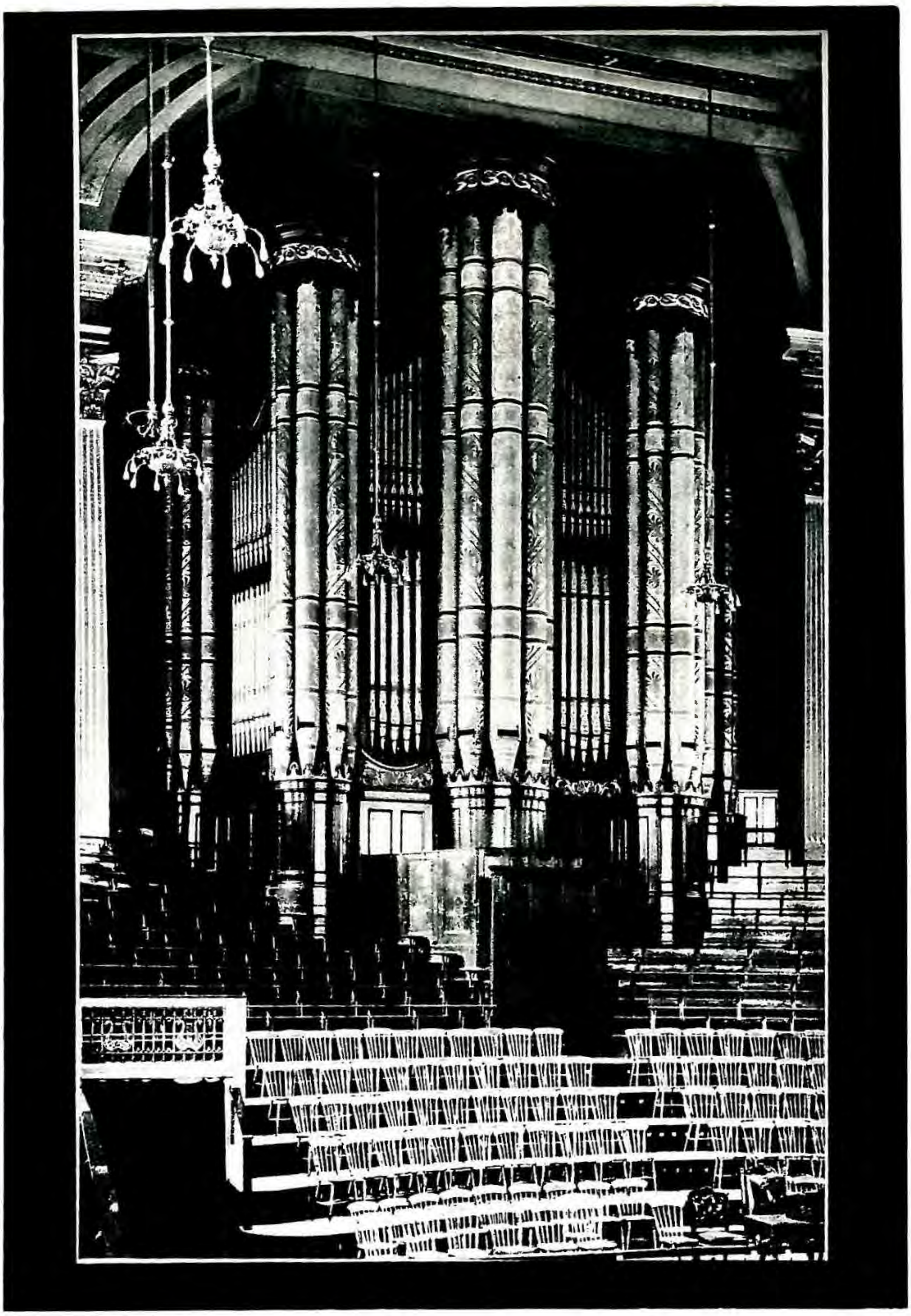

PLATE V.

Birmingham Town Hall organ.

This photograph was taken in recent times, but the general appearance of the organ has altered little since it was originally installed by William Hill in 1834. It was the first organ in Britain to have a "thirty-two-foot front", i.e. with the large pipes of the Pedal double open diapason displayed in its case

(Photograph from Org.3.145, from a block lent by Messrs. Hill, Norman and Beard, Ltd.)

One more unusual, but interesting, coupler remains for mention. At St.Giles', Camberwell, in his 1844 organ to Wesley's design, Bishop installed a stop entitled "Wood open to Pedals seperately". What else was this but an example of something which later in the century was advocated and widely adopted as a means of increasing the variety and flexibility of pedal organs: namely, pedal "borrowing", the making separately available of a manual stop on the pedal keys — in this case, the wooden Open diapason from the Great. Coming events were indeed casting their shadows before; and in a wonderful age of mechanical and engineering experiment, there were not lacking men of similar vision in the world of organs.

(b) Sforzando and Composition Pedals.

The first-named pedal, sometimes called the "sforzando coupler", was similar in principle to the obsolescent shifting-movement. On the pedal's being pressed, the Great became coupled to the Swell and remained so until the pedal was released, when the status quo was restored by means of a spring. Thus the Swell could be momentarily augmented more powerfully than by any swell-shutters. Two of the earliest organs to have this accessory were both of 1844 vintage: one at Worcester Shire Hall, the other at St.Olave's, Southwark, to which Hopkins definitely gives priority, ascribing it to Lincoln in that very year. (It will be recalled that this organ was completed by Hill in 1846). Others to follow were Ashton-under-Lyne (Hill,1845) and the

Boston Centenary Chapel (Gray and Davison, 1850), but it did not gain wide acceptance. It was rather an unsatisfactory contrivance from the musical point of view.

From the twenties onwards, most of the more important new organs were fitted with three or four composition pedals, and at first they almost all operated the Great stops only; though there were cases where organs had both composition pedals and shifting-movements, the latter being attached to the Swell. For example, at St.James', Bermondsey (Bishop 1829) the three composition pedals gave "Full", "Full without reeds" and "Diapasons"; and there was besides a "Shifting movement for shutting off all the Swell but the Diapasons", as well as a "Pedal for coupling Swell to Great". A coupling pedal of this sort is a rare occurrence at that period: whether it acted on the drawstop handle or only on the internal action is not recorded. But it is, at any rate, the ancestor of our present-day "reversible Swell-to-Great".

St.Edmund's, Lombard Street (also by Bishop, in 1835) had four composition pedals, as well as "Shifting movements to Swell". Both these organs, be it noted, had Swells which, though not CC, were much longer in compass than the average contemporary Swell. No doubt Bishop felt that the increased range, and therefore increased importance and utility, of this manual now deserved more assistance in registration than had hitherto been available. One more instance of how composition-pedals were arranged may be quoted: at Bath Abbey (Smith,

1835) there were four pedals for the eleven-stop Great, giving "Diapasons", "Full to fifteenth", "Full without reeds" and "Full Great".

The year 1840 provides the first instance of the Swell's being supplied with composition pedals as distinct from shifting-movements; at St.Luke's, Manchester (Hill, 1840) there were two for this manual, as well as three for the Great. A year later, the Great George Street Chapel in Liverpool, also by Hill, had five composition pedals: and, although their manuals are not specified, it is most likely that the arrangement was similar to that at St. Luke's. Both organs had the same builder, both were obviously designed as important instruments — and both were built under the supervision of Dr.H.J.Gauntlett.

The Gray and Davison organ at St.Paul's, Knightsbridge (1843) had the then exceptional total of eight composition pedals "to change the stops in the various organs" — which seems quite a strong hint that more than the Great and Swell were affected. St.Giles', Camberwell had a similar number of pedals in 1844; and in 1845 Bishop, at St. Mary's, Clapham shared his six pedals equally between Great and Choir, giving none of them to the Swell despite its being a CC manual and containing more stops than either of the other two. This odd allocation of composition pedals does not seem to have occurred elsewhere, but there are other early instances of the Swell's inclusion in the available total of pedals: St.Chad's, Shrewsbury (Gray and Davison,

1848) had two; and at Lee Parish Church, Kent (Bishop, 1850) there were four — as against only three on the Great. Since that time, as is well known, it has become quite common for the Swell to be served by some of the complement of composition pedals, after the needs of the Great and Pedal departments have been met.

(c) Ventils.

This type of stop control has always remained in general use in France, but has not met with the same popularity in Britain; however, as the nineteenth century went on, a small but appreciable number of organs was equipped with ventils, and the first of the few is to be found early in our present period. At. St.James', Bristol, Smith provided his organ in 1824 with four "wind-trunk valves" (as Hopkins, with commendable exactness, described them). More details

1) come from the pen of the correspondent in the "Harmonicon" of December 1824: "four wind-stops for shutting-off the wind at pleasure

> from either organ, of great use in case of ciphering, and also in producing a variety of effects not otherwise obtainable."

To those readers not familiar with the practical use of ventils, it may be pointed out that the player can cut off the wind from any department, prepare a combination of stops and bring it into operation when required, by releasing the ventil, which is usually in the form of a "hitch-down" pedal retained in its downward "on" position by a slot. Another organ fitted with a form of ventil was in Holy

1. Org.28.124.

Trinity, Gough Square, near Fleet Street (T.C.Bates, 1839) which had two of them: one to cut off the wind from all the Great except the two diapasons, and the other to restore it.

1) As Wedgwood pertinently remarks: "One of the main objections to the system rests in the fact that it imposes a constant tax on the player's memory — already sufficiently overburdened". However, he goes on, rather less pertinently: "It likewise involves a considerable amount of hand-registration. The English system, dispensing with ventils, secures rapid and indicatory stop-manipulation by means of pistons". This extolling of pistons and decrying of hand-registration would have evoked a blunt North-Country response from the greatest of nineteenth-century organists, W.T.Best, had he lived to read it; and in fact it has long been an accepted principle of organ-playing that, whereas pistons (especially adjustable ones) are very useful and very necessary, it is a poor organist who relies on them alone, and whose hands are never in contact with drawstop or stop-key.

(d) Pistons.

The debut and development of these "gilded knobs for the seduction of the organist's thumbs" (as Best referred to them) is usually associated with their appearance in Willis' celebrated organ at the 1851 Exhibition. However, Willis did instal them in one earlier instrument, no doubt to try them out before using them in his chef d'oeuvre.

2) This was a two-manual which he built in about 1850 for the old Surrey

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1. Wedgwood, op.cit., p.169.

2. Some doubt has been thrown on the date of this organ, the opinion being expressed that it was built several years later. But Mr.Cecil Clutton reaches the firm conclusion, after examining the organ, that the date 1850 is quite correct.

Chapel, where his father was a chorister; and the organ now stands in Manor Chapel, Bermondsey ever since the demolition of the other building years ago. There were originally four thumb pistons, but they have long since disappeared; and in any case the action of this organ was tracker, whereas Willis' new pistons really came into their own in conjunction with his improved form of pneumatic.

(e) Tremulant.

The first reference to this stop in any English organ is well-known: it occurred in Dallam's organ for King's College, Cambridge in 1605, as "ye shaking stoppe"; and there were "trimoloes" in some of Father Smith's and Snetzler's instruments. But the early tremulant must have been a crude and noisy contrivance, and it never became popular in Britain until improvements had been devised in France and followed-up by British builders. The forerunners of the nineteenth-century "Tremulant Revival" seem to have been Worcester Shire Hall and St.Luke's, Old Street, by Nicholson and Gray and Davison respectively, both in 1844. It remained for Willis to apply the finishing touches to these improvements early in the second half of the century, with his tremulants of adjustable speed.

(f) Percussions.

Here again, as in the previous paragraph, the events of this second quarter-century form an introduction, on a small scale, to much greater activity during the period of Chapter Three. One of the

features of the concert-hall organs which were just beginning to be set up in almost every large city, was the provision of percussions,
1) often some kind of bells. The Apollonicon and its kettledrums have already been noticed; and a quite common pseudo-percussion, ever
2) since Harris' Salisbury Cathedral organ in 1710, had been the "Drum Pedal" consisting of two large pipes tuned very close together in pitch so as to produce a resultant "beat" or vibration — a heavy throb, in fact. The popularity of this device does not speak very highly for the musical taste of the eighteenth century; and there were still at least five of these obsolescent acoustical monstrosities in existence at the beginning of the nineteenth. In later pages we shall encounter its big brother, the Victorian "Thunder Pedal".

Hill's 1834 Birmingham had a so-called "Carillon" on the Swell keyboard, but behind this imposing title lay nothing more than a set of common house bells, which nevertheless were allowed to survive until 1890. We are told that the Chevalier Neukomm had a great deal to do with the Birmingham design in its early days, and at one of the Birmingham festivals his organ-recital included a portrayal of
3) a village wedding and a storm. "Bells were suspended, to be played

> by the fingers on the keys. The romantic Neukomm arranged a number of boards which, when falling, were supposed to imitate thunder. Mr. William Hill, the celebrated organ-builder,........had protested in vain against these inartistic additions, but Neukomm's

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1. vide supra, p. 46.
2. vide supra, p. 11.
3. William Glover, "Memoirs of a Cambridge Chorister", p.44-5.

opinions prevailed. At a certain signal Mr.Hill was to pull a cord and 'bring down the house' in a popular sense. The wedding bells jingled fairly well, and all proceeded tolerably and to be endured, when Neukomm turned to draw out a stop. This movement was supposed to be the signal agreed upon, and down came a tremendous peal in the middle of a tranquil summer afternoon......."

It is good to be able to report that "in consequence, these very doubtful attractions were afterwards dispensed with, the organ was to a certain degree reconstructed, and Mr.Hill and musicians generally rejoiced that the noble organ was no longer hampered with needless and undesirable innovations."

There were apparently no other ventures into this type of organo-campanology during this period. Chapter Three will usher in the era of the Cyclorama and Panopticon organs, and throughout the rest of the century various kinds of percussions will appear with steady regularity -- and by no means always in secular instruments.

(g) Wind-supply.

This particular period was one of widespread engineering progress in Britain, and the organ was soon to derive benefit from the new science. Mechanical blowing was, in fact, just round the corner, and the hydraulic blowing engine was due to arrive in the fifties. Meanwhile, a number of small but important improvements continued to be made. Smith's ingenious crank-and-wheel mechanisms at Bristol

1) have been referred to already; and he used one again at Christ Church in that city in 1850. This, like the Bristol Cathedral apparatus, added the merit of longevity to its ingenuity, and was still available in full working order (in case of electricity failure) as late as 1947. A similar blowing-gear, complete with cranks, connecting-rods, handle and large flywheel, was installed in Winchester Cathedral in 1846 by James Blyth, an Isleworth builder whose father Benjamin had built this organ in 1825.

Ward's 1823 York Minster organ obviously needed something out-of-the-ordinary for its wind-supply: and we find that it had two bellows, each four feet square and each carrying a weight of 400lbs, to the Pedal organ; and a larger bellows (12ft by 8ft, carrying 852lbs) was driven by a flywheel to supply the remainder of this 3,200-pipe instrument.

Bishop's important invention of the Concussion-bellows — or Concussion-valve — was first used by him in his organ at the Covent Garden Theatre in 1825, and again at St.Paul's Cathedral in the following year. This was designed to regulate the wind-supply and to obviate the fluctuations of pressure described on page 49. It was a small supplementary bellows, fitted to the wind-trunk or the bottom of the wind-chest, and automatically compensating for any sudden rise or fall in pressure. Incidentally, it was not until 1826 that St. Paul's Cathedral was fitted with horizontal bellows: it had hitherto retained the old diagonal type, which could no doubt now be adapted to act as "feeders" for the new horizontal reservoir, as happened in so many similar conversions at this time; for instance, Chichester Cathedral in 1829.

Both builders and players soon found that this increased efficiency of wind-supply, and the heavier pressures which were introduced in the thirties, brought corresponding disadvantages. The pallet admitting air from windchest to pipe had to open, not only against the pressure of its own spring, but also against the resistance of the wind which was seeking entrance to the pipe-foot. Increased pressure rendered the opening of the pallet more and more difficult — and even when the weight of this resistance was removed from the player's finger by the intervening agency of pneumatic action, the pallet's own
1) inertia remained. Hill solved the problem in 1841 by his invention of the "box-pallet", in which the pallet no longer opposed its entire surface to the thrust of the wind-pressure, but opened more or less at right-angles to it, and presented merely its edge; thus not only was its opening made much easier, but double the quantity of wind could be admitted.

(h) The Console.

Several developments affecting the console itself have been observed under other headings (e.g. the radiating pedalboard on page 98 and detached console on pages 110 and 111). A patent was taken out

1. Hopkins and Rimbault, p.35.

in 1849 by William Sweetland of Bath, for an invention which can be considered the precursor of the modern stop-key. Most organists have the impression that the stop-key originated at the end of the century, in the hands of Hope-Jones and Hele (and not so many of them are aware even of Hele's share in this development); but in fact its conception dates back to Sweetland's patent and to Hill's 1851 Exhibition organ, which will be described in the next chapter. Sweetland's device con-
1) sisted of "a series of small brass keys working in pairs on a rocking lever placed where the key slip is usually found, their number corresponding to the number of stops on the organ. The depression of any one of these caused the stop-knob to come out, and the depression of the duplicate key took the stop off." Despite the date of his patent, Sweetland does not seem to have put it into practice before about 1858.

Much of what was said about the awkwardness and clumsiness of the console in Chapter One is still applicable. The present organist of Tewkesbury Abbey, Mr. Huddleston Stubington, in describing the famous "Milton" organ in his church, as rebuilt by Willis in 1848 and still kept playable up to the time of its incorporation in the very extensive rebuild of recent years, writes that

2) "the action is bad, the touch heavy (dreadfully heavy with the manuals coupled) and the stop movements uncertain. A clumsy horseshoe pedal and one ordinary composition pedal are the only assis-

1. Org.33.46
2. Org.24.100

tance offered to the player in controlling his twenty-four stops; the stop-knobs are small and mounted on square shafts. The swell pedal is an atrocimus piece of mechanism which rises so high when the shutters are closed that the player's knee comes into contact with his arms."

The arrangement of the stops, in a single or double column on "square" stop-jambs (i.e. parallel with the keyboards) meant that in an instrument of any size the uppermost stops were uncomfortably high, to put it mildly. Photographs of the Tewkesbury console and of the St.John's, Hackney, console dating from Gray's rebuild of 1828, show the single columns of stops going up to a point about level with the top of the music-desk, and higher than the top of the player's head. The manuals did not overhang, and so the Swell and the music-desk were several inches further away than is the case to-day.

1) Dr.Hopkins' detailed suggestions and recommendations regarding the console, written at the century's halfway point, give a fairly clear picture, not only of what was the general practice in his day, but also of what was considered up-to-date and desirable. For instance, he expresses disagreement with what was then a common practice on the older organs, of having the stops of one department divided between the two stop-jambs, and he goes on:

"A far better arrangement is the modern English one of placing all the stops of each department together, as the contents of each

1. Hopkins and Rimbault, pp.283-6.

division can then be so much more easily distinguished from the rest." This (to us) obvious disposition of stops was only just coming into adoption as Hopkins wrote. His further remarks, on this point and on the console in general, are well worth a somewhat lengthy quotation:

"Besides keeping them separate, as above, the Stops of each department should further be placed where they can be combined or changed with the least difficulty to the performer. With a view to the attainment of this end, it is important to bear in mind the two following facts: (1) that as a rule the left hand can more easily be spared for a moment than the right; and (2) that the Great organ stops are more frequently brought under the control of the feet of the performer by means of Composition Pedals than those of any other department. The right-hand side is therefore the best side on which to place the Great organ Draw-stops, as they can be drawn in or out, in all the ordinary and most frequently required combinations, without any assistance whatever from the hand.

"The Swell and Choir organs are not nearly so often acted upon by Composition pedals. Moreover, as the numerous delicate shades and varieties of tone are produced from those departments chiefly — leaving the Great organ for the broad contrasts — the left side appears the most proper one whereon to place their drawstops. As the bass part of the music can be continued by the Pedals, the left hand can, by a little contriving, be for a moment spared for offfecting the necessary changes in the combinations, without in the least degree disturbing the progress or completeness of the music.

"The Pedal organ-stops and the various Manual couplers might be placed on the right-hand side, with a view to securing as nearly as possible an equal number of stops on both sides of the keys, which is always desirable. But the Pedal couplers should, whenever practicable, be ranged on the left-hand side, to facilitate the making of those quick changes from one manual to another, that are so constantly required in accompanying the musical service, as well as in solo-playing..............In arranging the places for the several stops of any one department, it is best, first, to keep the Reed and Flue-stops quite separate. The Reed Stops should be placed above, and the Flue Stops below."

Hopkins goes on to recommend the stop-layout which became, in due course, universal, by which the flue-stops are placed in order of pitch, with the 16ft at the foot of the jamb and the fifteenth or mixtures at the top, with the reeds in similar order above them. As the reader is aware, the plan of having the Great stops on the right is always the case to this day, but in a three-manual the Choir is usually on the right, with Swell and Pedal on the left. Couplers are now, more often than not, "grouped with the department they augment" as the specifications describe it.

"The several Drawstops" continues Hopkins, "are generally arranged in single, double or triple vertical rows on each side "of the manuals, according to their number and the size of the organ. The Drawstops of the organ in Cologne Cathedral are arranged in four horizontal rows; and so are those of many other Contintal organs. At Westminster Abbey, the drawstops are also placed in this manner..............In small organs of two manuals, the Great and Swell stops are generally arranged so as to form each a separate row, one on the right, the other on the left. An ivory or brass plate inserted above each row, bearing the name of the Clavier to which that tier belongs, is in that case all that is required to mark the requisite distinction. This plan....is far preferable to that of crowding such announcement on every individual Stop-handle, in addition to the name..............

"Other means are sometimes taken....for distinguishing the Draw-stops of each department. Thus...the ivory plates in the face of the stop-handles of some of the departments are sometimes stained red, blue, green or some other colour............Different substances are also occasionally used for the name-plates, for increasing the distinction; as ivory for those of one department, mother-of-pearl for a second, porcelain for a third, tortoise-shell for a fourth; and so on. These, however, give to the general appearance of the Drawstops a motley effect; as the colours, if deep, give them a heavy and patchy appearance. Another plan is to have the names of one department on each side printed in black, the other in red. This has a light and handsome effect...........

"Every stop should have its name engraved on the handle, in preference to being placed over or at the side of it; as this prevents the possibility of the inscription being by mistake read as referring to any other than the right drawstop. The names are sometimes engraved on plates of zinc or brass, and inlaid; but those metals soon become tarnished. Many organs have the names of the stops printed on pieces of paper, which are pasted on, near to the handles; but such labels are apt to become soiled or rubbed off, and at the best present but a mean appearance. The head of each stop-handle is usually turned out, and a plate of ivory or some other bright material inserted, bearing the requisite inscription................Old English text for the names has a handsome appearance, and is particularly appropriate for Church organs. It is better to have the names engraved in horizontal lines rather than in a circle following the outline of the plate. It is then deciphered more easily and more quickly.............

"From 2½ to 3 inches is a good distance for the Drawstops to move backwards and forwards. The Drawstops, which are better for being of a good medium size, should not be placed too closely together. If the knobs are 1½ inch in diameter, with ivory plates 1¼ inch wide, and have the inscriptions cut in letters 3/16 of an inch high, they will have a bold and handsome appearance."

The three-inch "travel" of the stop-knob, as well as its size, has been somewhat modified in the twentieth century; but it remained

fairly constant for the greater part of the nineteenth, as many surviving late-Victorian consoles can testify. Hopkins' approval of red and black lettering has found support among many modern builders who use black lettering for speaking-stops and red for couplers and tremulants (Harrison, for example, and Rushworth and Dreaper). Colouring of stop-keys was an important part of Hope-Jones' consoles, but re-
1) mained exceptional on draw-knobs. Considering the extraordinarily rapid growth in organs during the century, the console may be said to have kept pace with organ-design remarkably well, and to have adapted itself very quickly, by a correspondingly rapid process of trial and error, as it evolved into the extremely comfortable and handsome affair which it became in the nineties, and which, in some instruments, it still is to-day.

(i) Tuning and pitch.

Temperament (in both senses !) was one of the several casus belli which divided organists into two quite hostile camps shortly before and for some time after the middle of the century. There are mysteries involved in this question of temperament which will apparently never be explained; and one of them concerns men such as Samuel Wesley,
2) who did so much to awaken his countrymen to an appreciation of J.S. Bach. He was among those who gave regular recitals on piano and organ of Bach's "48" — for instance, on one occasion in 1812 he performed

1. Coloured draw-knobs were used at St.Martin's-in-the-Fields (Bevington,1854); and Freeman,writing in 1921, reports that some Hill organs of 60 or 70 years before, had them.
2. Another devoted Bach enthusiast was Dr.Hodges of Bristol, who used to begin each day's work by playing one of the "48", and who carried his devotion to the extreme length of having one of his sons christened John Sebastian Bach Hodges.

1) all of them at a single sitting. How then, it may be asked, was such a performance possible or tolerable on unequally tempered instruments ?

Whatever the answer, it is good to be able to record that, before the century reached halfway, two notable organs had been tuned to equal temperament: Birmingham (Hill 1843) and Exeter Hall, London (Walker, 1848). These were some years in advance of the general acceptance of this tuning, and the two builders deserve great credit for their bold initiative; especially Walker, whose professional career and reputation were still in their infancy, and who must have known that many of the most influential organists in the country were hotly opposed to this reform.

2) The slight but appreciable tendency for pitch to rise is maintained. Philharmonic pitch in 1813 had been on A of 423.7; by 1835 it was up to 426.6, and organs from time to time found it necessary to follow the pitch upward. Leeds Parish Church, for example, was raised half a tone in 1840, to "the Philharmonic of Sir George Smart's fork".

The famous Temple Church "quarter-notes" re-appear in 1843, when Bishop added them to the Tenor C Swell manual: only Great and Choir had been thus equipped hitherto. This experiment in temperamental compromise had been all very well in the late seventeenth and early eighteenth centuries; but it now so far outlived its time that it was allowed — even by Dr.Hopkins, who was appointed Temple organ-

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1. Lightwood, "Samuel Wesley, Musician", p.157
2. vide supra, p. 51.

ist in this very year of 1843 — to remain for thirty-five years more. Hopkins, in his great treatise with Rimbault, writes as a firm supp-
1) orter of equal temperament; unequal tuning he describes as "a source of pain to sensitive ears", and yet the Temple organ retained its quarter-notes (and therefore its unequal tuning) until 1878, more than twenty years after those words were written; and this despite frequent additions and alterations to the organ, in 1849 (when new white keyboards were substituted for the old black ones), 1856, and about 1860.

An attempt was made at Stuttgart in 1834, by a Congress of Physicists there assembled, to carry into effect a proposal to fix the pitch of A at 440; but little or nothing seemed to emerge from this plan.

York Minster Postscript.

The York organ, for all the faults in its design which modern wiseacres are quick to decry while giving Camidge, Ward and Hill very little credit for its remarkable features, was nevertheless one of the truly outstanding instruments of the century, historically speaking. Its value was that it was directly responsible for accelerating the progress of organ-building in Britain by an inestimable number of years. This seems to be a suitable place for a note on the closing stages of the lives of Dr. Camidge and his organ; the death of the one in 1859 very quickly put an end to the other. York has ever since

1. Hopkins and Rimbault, p.178.

then been served by the finest of instruments, through its successive rebuilds; but it has ceased to be a byword, a phenomenon among organs, such as it was for thirty-six years. The story cannot be better told than in the words of that devoted organ-antiquarian, the Rev. J.H. Burn. In a letter to "The Organ" in October 1925, he wrote:

1) "..........The doctor (i.e. Camidge)....was by no means altogether pleased with his bargain. Even before the organ was finished, he started harassing the builders with complaints. In October 1832, he wrote thus to them: 'Mr.Gray, and many such, express disappointment in the power or loudness, contrasted with the late organ. Could you not add a three-rank cornet and sesquialtera to the fifteenth ? We certainly miss our late grand cornet.' Again, in July 1833, speaking of the two-mouthed pedal diapason, he remarks: 'It would be disgraceful to leave it in its present feeble state.........It is a burlesque and absurdity for such pipes to give out a mere whisper; and most foolish to suppose I can sanction their being left, and the organ said to be complete in such an infirm state.'

"Nor did his jeremiads cease when at length the instrument was handed over as complete: for in December 1834, he asks: 'Cannot you do something to the pedal reeds ? They are certainly most diabolical affairs at present.' And eight months later he is still far from satisfied: 'The reed 32ft is of no musical value in the last octave; in fact, it has never been finished. The Choir trum-

1. Org.5.125-6.

pet, which was to have been 16ft, goes no lower than GG. The wood
1) principals are not harmonicas as they were to have been. The Swell dulciana runs into a stopped bass. The Swell cornet last break is bad.'

"Still later, in February 1837, Dr.Camidge states that the great error of the builders consisted in their 'not voicing and winding the pipes to and in the Minster'; and it is certainly surprising to learn that when they arrived from the factory in London they were merely put in their places and left there without being tuned. But there can be little doubt that the general inefficiency of the organ was due mainly to Dr.Camidge's fantastic specification. This is clearly indicated by his successor, Dr. E.G.Monk, in a pamphlet entitled 'Descriptive Account of the York Minster Organs(1863)'. Dr.Monk bears ample testimony to the constructive ability bestowed by Messrs Elliott and Hill upon the instrument: the breadth and amplitude of the system of wind supply, wind chests and scales of pipes; and attributes the failure to the prevalence of false and vague theories upon the nature and disposition of stops, leading to many grave errors of design....."

2) Here let Dr.Monk himself take up the tale: "The faults of the first arrangement were still not only uncorrected but made more prominent by the useless system of multiplication of stops of a calibre and tone already existing; while the persistent ex-

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1. "Harmonicas" -- presumably Camidge was referring to a type of Pedal stop used in German organs; a soft and delicate open flute, slightly stringy.
2. Dr.E.G.Monk, op.cit., quoted in Org.5.200.

clusion of a corrected manual compass and stops of 16ft tone converted the whole into a discordant mass, destitute of order, system and effect." Freeman, in quoting these observations of Monk, goes on to comment: "But what could be expected, seeing that thirty-six stops had been crowded onto the Great organ sound-board that had been originally designed to take but twenty-four; while the Swell-box, through alterations and additions (the two tubas had been crammed into it) had lost all effective powers of crescendo and diminuendo."

Burn's account may now be resumed: "It may here be observed that Dr.Camidge was quite familiar with the Continental employment of manual doubles; and deliberately excluded them on the plea that it is 'much the best and most complete plan to extend the manual compass to CCC, thereby giving sufficient scope and a clear range for both hands and feet, and enabling the organist to work the middle or tenor part of the organ with his left hand, and so produce a much richer and more varied and perfect effect than can be given by a performer (who may be an indifferent or no pedalist) grumbling with his left hand and squeaking with his right, with so great a distance between them as if they were afraid of each other.'

"Such were the worthy doctor's sentiments and he remained true to his principles to the end. That being so, of what avail was it that the wind pressure was increased (in the bass, of all places), that the scales of the pipes were enlarged to an enormous extent, that more unisons and octaves were crammed in wherever room could be found for them, or even that a fourth (solo) manual with tubas of 16ft and 8ft pitch added ? At the time of Dr.Camidge's death in 1859, the number of stops had mounted from fifty-two to seventy-five, with but little (if any) improvement in the instrument; and the Dean and Chapter at length realised that nothing less than an entire reconstruction would meet the situation..........."

Finally, the 1859 specification may be briefly summarised here, for comparison with the 1832 organ, which is set out in full in the specification appendix which follows this chapter:

Great(36 stops)

4 Open diapasons	8
2 Stopped diapasons	8
6 Principals	4
2 Principals, wood	4
2 Flute principals	4
2 Twelfths and Fifteenths	
4 Fifteenths	2
2 Tierces	1 3/5
2 Larigots	1 1/3
Cornet	X
Cymbal	VII
2 Sesquialteras	VII
Posaune	8
2 Trumpets	8
Bassoon	8
2 Clarions	4

Swell: now 18 stops, as against 12 before.

Choir: now 11 stops, as against 9 before.

Solo: Tubas at 16ft and 8ft (added just after previous rebuild).

Pedal: One stop less than before (8ft reed gone; 16ft Subbass in place of 32ft Double stopped diapason.)

- o - o - o - o - o - o -

PLATE VI.

S.S.Wesley's organ at Gloucester Cathedral.

The console as it was from the time of Willis' rebuild in 1847 (his "stepping-stone to fame") until he again rebuilt the organ in 1889. Wesley was organist here from 1865-1876, the year of his death; and towards the end of his life he was trying to persuade the Dean and Chapter to undertake the restoration of the organ, and even offered to begin the subscription-list with a ten-guineas contribution. However, his suggestions fell on deaf ears, and nothing was done until 13 years afterwards.

(Photograph from "Memories of Choirs and Cloisters" by A.H. Brewer, page 20)

SPECIFICATIONS

(to illustrate Chapter Two)

1. YORK MINSTER — Ward, 1823

Great(24 stops)

(East soundboard)	(Nave, or West soundboard — enclosed)
Open diapason	Open diapason
Open diapason	Stopped diapason
Stopped diapason	Principal
Principal	Harmonica
Nason	Twelfth
Twelfth	Fifteenth
Fifteenth	Flageolet
Sesquialtera, III	Mixture, IV
Cymbal, V	Clarinet
Cornet(mid.C), V	Bassoon
Trumpet	
Clarion	

Pedal(15 stops)

(Right section)	ft
Double open diapason	24
Double stopped diapason	24
German stopped diapason	12
German principal	12
Sackbut	24
Trombone	12
(Left section)	
Double open diapason	24
Double stopped diapason	24
German stopped diapason	12
German principal	12
Sackbut	24
Trombone	12
Shawm	12

(The Pedal organ was located inside the stone choir-screen, right and left of the organ.

Swell(8 stops)	Choir(8 stops)
Open diapason	Open diapason
Stopped diapason	Stopped diapason
Dulciana, metal	Stopped diapason
Dulciana, wood	Dulciana
Principal	Principal
Cornet	Flute
Trumpet	Octave flute
Hautboy	Sesquialtera

Couplers

East Great to Keys
Nave Great to Keys
Swell-to-Great
Choir-to-Great
Great-to-Pedals
Choir-to-Pedals

Compass

Great and Choir:	FFF to F, 60 notes
Swell:	FF to F, 49 notes
Pedal:	FFFF to CC, 19 notes

(Specifications — Chapter Two — continued)

2. ST.JAMES' CHURCH, BRISTOL — John Smith, 1824

Great(15 stops)		Swell(10 stops)		Choir(5 stops)	
Open diapason	8	Open diapason	8	Stopped diapason	8
Open diapason	8	Stopped diapason	8	Dulciana	8
Stopped diapason	8	Principal	4	Flute	4
Principal	4	*Twelfth	2 2/3	Fifteenth	2
Twelfth	2 2/3	*Fifteenth	2	Principal	4
Fifteenth	2	*Tierce	1 3/5		
*Fifteenth	2	Cornet	III	Inside Choir(borrowed)	
*Tierce	1 3/5	Hautboy	8		
*Larigot	1 1/3	Trumpet	8	Open diapason	
Twenty-second	1	Cremona	8	Stopped diapason	
Mixture	II			Flute	
Mixture	II			Principal	
Sesquialtera	III			Clarionet	
Trumpet	8				
Octave bassoon	4				

Pedal(5 stops)

Double stopped diapason	32	Four
Open diapason	16	wind-trunk
Stopped diapason	16	valves.
Principal	8	
Bassoon	16	

Couplers

Swell-to-Great
Swell-octave-to-Great
Swell-to-Choir
Choir-to-Great
Great-to-Pedal
Choir-to-Pedal

Compass:

Great and Choir: GG to E, 53 notes
Swell: GG to C, 49 notes
Pedal: GGG to G,25 notes

(*separate mutations, forming part of Sesquialtera and Cornet stops)

3. BRUNSWICK CHAPEL, LEEDS — Booth, 1828

Great(11 stops)

Double open diapason (21 1/3)
Open diapason
Open diapason
Stopped diapason
Principal
Twelfth
Fifteenth
Sesquialtera, IV
Cornet, V
Trumpet
Clarion

Choir(8 stops)

Double dulciana
Open diapason
Viol da gamba
Stopped diapason
Principal
Flute
Bassoon
Cremona

(continued overleaf)

(Specifications — Chapter Two — continued)

(Brunswick Chapel, Leeds: continued)

Swell(12 stops)

Double open diapason	16
Open diapason	8
Stopped diapason	8
Dulciana	8
Clarabella	8
Viol da gamba	8
Principal	4
Cornopean	8
Hautboy	8
Trumpet	8
Cremona	8
Clarion	4

Pedal(4 stops)

Double open diapason	32
Open diapason	16
Principal	8
Trombone	16

Couplers:
Swell-to-Great   Great-to-Pedal
Choir-to-Pedal   Choir-to-Great

Compass:
Great(and Choir ?) GG to F, 58 notes
Swell   CC to F, 54 notes
Pedal   CCC to C, 25 notes

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4. BIRMINGHAM TOWN HALL — Hill, 1834

Great(16 stops)

Open diapason	8
Open diapason	8
Open diapason	8
Open diapason,wood	8
Stopped diapason,wood	8
Principal	4
Principal	4
Principal,wood	4
Twelfth	2 2/3
Fifteenth	2
Sesquialtera	IV
Mixture	III
Posaune	8
Trumpet	8
Clarion	8
Octave clarion	4

Swell(10 stops)

Double dulciana	16
Open diapason	8
Stopped diapason,wood	8
Principal	4
Harmonica	4
Fifteenth	2
Horn	8
Trumpet	8
Oboe	8
Clarion	4

Pedal(4 stops)

Open diapason	32
Open diapason,wood	32
Open diapason,wood	16
Trumpet, wood	16

Choir(8 stops)

Open diapason	8
Open diapason,wd	8
Dulciana(Gam.G)	8
Stopped diapason	8
Principal	4
Flute	4
Fifteenth	2
Cremona and bassoon	8

(continued overleaf)

(Birmingham Town Hall: continued)

Combination or Solo Organ(17 borrowed stops)

Open diapason	)	Open diapason	)	
Open diapason	)	Stopped diapason	)	
Dulciana	)	Principal	)	
Stopped diapason	) Solo	Harmonica	) Solo	
Principal	) Choir	Fifteenth	) Swell	
Flute	)	Horn	)	
Fifteenth	)	Trumpet	)	
Cremona & Bassoon	)	Oboe	)	
		Clarion	)	

Couplers,etc.

Sw. to Gt.
Ch. to Gt.
Ped. to Gt.
Ped. to Ch.
Ped. to Sw.
Pedals only
Combination Ch.
Combination Sw.
7 Composition Pedals

Compass: Gt. and Ch: CCC to F, 66 notes
Sw: CC to F, 54 notes
Ped: CCC to C, 25 notes

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5. YORK MINSTER — Elliott and Hill, 1832-1833

Great(24 stops)

Open diapason,No.1	8	)
Open diapason,No.2	8	)
Stopped diapason	8	)
Principal,No.1	4	)Dupli-
Principal,No.2	4	)cated
Principal,wd(flute)	4	)on East
Fifteenth,No.1	2	)& West
Fifteenth,No.2	2	)sound-
Sesquialtera	VII	)boards
Mixture	IV	)
Trumpet,No.1	8	)
Trumpet,No.2	8	)

Swell(13 stops)

Open diapason,No.1	8
Open diapason,No.2	8
Dulciana(ten.C)	8
Stopped diapason 1	8
Stopped diapason 2	8
Principal	4
Principal,wood	4
Fifteenth	2
Sesquialtera	IV
Oboe	8
Horn	8
Trumpet	8
Cremona	8

Couplers,etc.

Sw. to Gt.oct.
Sw. to Gt.
Ch. to Gt.
Gt. to Ped.
Ped. oct.
Sw. to Ch.
Ch. to Ped.
Wind trunk valve to West Gt.
Wind trunk valve to East Gt.

Choir(9 stops)

Open diapason,No.1	8
Open diapason,No.2 (mid.C)	8
Dulciana (CC)	8
Stopped diapason	8
Principal	4
Flute	4
Fifteenth	2
Trumpet(bassoon)	8
Trumpet,No.2(one oct. only,from Pedal)	8

Pedal(9 stops)

Double open,wood	32
Double open,metal	32
Double stopped,wood	32
Open diapason,No.1,wd	16
Open diapason,No.2,wd	16
Open diapason,metal	16
Sackbut	32
Trumpet	16
Trumpet	8

Compass:

Gt. and Ch: CCC to C, 73 notes
Sw: CC to C, 61 notes
Ped: CCC to C, 25 notes

(Specifications — Chapter Two — continued)

6. BATH ABBEY — John Smith, 1835

Great(11 stops)

Open diapason	8
Open diapason	8
Stop diapason	8
Principal	4
Principal	4
Twelfth	2 2/3
Fifteenth	2
Sesquialtra(sic)	III
Mixture	III
Trumpet	8
Clarion	4

Swell(8 stops)

Open diapason	8
Open diapason,wd	8
Stop diapason	8
Principal	4
Cornet	III
Hautboy	8
Trumpet	8
Clarion	4

Choir(8 stops)

Open diapason	8
Dulciana(FF)	8
Stop diapason	8
Principal	4
Flute	4
Twelfth	2 2/3
Fifteenth	2
Cremona,treble) Bassoon,bass)	8

Pedal(1 stop)

Open diapason	16

Couplers

Gt. to Ped.	Sw. to Gt.
Ch. to Gt.	Sw. to Ch.
Ch. to Ped.	Sw. to Gt.oct.

Composition pedals (Great)

1. Diapasons
2. Full to Fifteenth
3. Full without reeds
4. Full Great

Compass: Gt. and Ch: CCC to C, 73 notes
Sw: GG to C, 66 notes
Ped: CCC to B, 24 notes

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7. ST. PETER'S, CORNHILL — Hill, 1840

Great(18 stops)

(Tenoroon(ten.C)) (Bourdon(lowest oct.))	16
Principal diapason	8
(Stopped diapason,treble) (Stopped diapason,bass)	8
Dulciana(ten.C)	8
Claribel flute(ten.C)	8
Principal octave	4
Wald flute	4
Oboe flute	4
Stopped flute	4
Twelfth	2 2/3
Fifteenth	2
Tierce	1 3/5
Sesquialtera	II
Mixture	II
Doublette	II
Corno trombone	8
Corno clarion	4
Cremorne(ten.C)	8

Pedal(2 stops)

Great diapason	16
Contra posaune	16

Couplers,etc.

Sw. to Gt.
Gt. to Ped.
Sw. to Ped.
Oct.Ped.
4 Composition pedals

(continued overleaf)

(Specifications — Chapter Two — continued)

(St.Peter's, Cornhill: continued)

Swell(16 stops)

(Tenoroon dulciana) (Bourdon(lowest oct.))	16	Fifteenth	2
Principal diapason	8	Piccolo(ten.C)	2
Stopped diapason,treble) Stopped diapason,bass)	8	Sesquialtera	III
Principal octave	4	Mixture	II
Suabe flute(ten.C)	4	Echo dulciana cornet	V
Flageolet(ten.C)	4	Cornopean	8
Twelfth	2 2/3	Tromba	8
		Hautboy	8
		Clarion	4

Compass: Gt. and Sw: CC to F, 54 notes
Ped.(clavier)CCC to A,22 notes
Ped.(pipes) CCC to BB, 12 pipes

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8. GREAT GEORGE STREET CHAPEL, LIVERPOOL — Hill, 1841

Great(15 stops)

(Tenoroon(ten.C)) (Bourdon(1 oct.))	16
Open diapason	8
Open diapason	8
Stopped diapason	8
Quint	5 1/3
Principal	4
Flute	4
Tenth	3 1/5
Twelfth	2 2/3
Fifteenth	2
Sesquialtera	III
Mixture	III
Doublette	II
Posaune	8
Clarion	4

Swell(19 stops)

(Tenoroon(ten.C)) (Bourdon(lowest oct.))	16
Open diapason	8
Dulciana	8
Stopped diapason	8
Quint	5 1/3
Principal	4
Suabe flute	4
Twelfth	2 2/3
Fifteenth	2
Flageolet	2
Sesquialtera	III
Mixture	II
Echo cornet	V
Contra fagotto	16
Cornopean	8
Trumpet	8
Oboe	8
Corno flute	8
Clarion	4

Choir(8 stops)

Open diapason	8
Dulciana	8
Stopped diapason	8
Clarabella	8
Principal	4
Stopped flute	4
Wald flute	4
Oboe flute	4
Cremona	8

Pedal(6 stops)

Open diapason	16
Bourdon	16
Principal	8
Fifteenth	4
Sesquialtera	V
Trombone	16

Solo(1 stop)

Tuba mirabilis	8

Couplers: Sw. to Gt.
Gt. to Ped. Ch.to Gt.
Sw. to Ped. Ch.to Ped.
5 Composition pedals

Compass: All manuals: CC to F, 54 notes.
Pedal: CCC to D, 27 notes.

(Specifications — Chapter Two — continued)

9. STRATFORD-ON-AVON PARISH CHURCH — Hill, 1841

Great(16 stops)

(Bourdon(1 oct.)) (Tenoroon diapason)	16
Principal diapason	8
(Stopped diapason, treble) (Stopped diapason, bass)	8
Dulciana	8
Quint	5 1/3
Principal octave	4
Wald flöte	4
Oboe flute	4
Twelfth	2 2/3
Fifteenth	2
Octave fifteenth	1
Sesquialtera	
Mixture	
Corno trombone	8
Corno clarion	4
Cromorne	8

Swell(10 stops)

(Bourdon) (Tenoroon diapason)	16
Principal diapason	8
(Stopped diapason, treble) (Stopped diapason, bass)	8
Principal octave	4
Suabe flöte	4
Flageolet	2
Doublette	II
Echo dulciana cornet	V
Oboe	8
Cornopean	8

Pedal(6 stops)

Open diapason	16
Bourdon	16
Principal	8
Fifteenth	4
Mixture	V
Posaune	16

Couplers

Sw. to Gt.
Gt. to Ped.
Sw. to Ped.
Oct. Ped.
3 composition pedals

Compass:
Gt. and Sw: CC to F, 54 notes.
Ped: CCC to D, 27 notes.

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10. BIRMINGHAM TOWN HALL — Hill, 1843

Great(18 stops)

Double diapason	16
Open diapason	8
Open diapason	8
Open diapason	8
Stopped diapason, wd	8
Principal	4
Principal	4
Quint	5 1/3
Twelfth	2 2/3
Fifteenth	8
Sesquialtera	V
Mixture	III
Fourniture	V
Doublette	II
Double trumpet	16
Posaune	8
Clarion	4
Octave clarion	2

Choir(9 stops)

Open diapason	8
Hohl flute, wood	8
Stopped diapason, wd	8
Principal	4
Stopped flute, wood	4
Octave flute, wood	4
Wald flute, wood	4
Fifteenth	2
Cornopean	8

(continued overleaf)

(Specifications — Chapter Two — continued)

(Birmingham Town Hall: continued)

Swell(12 stops)

Double dulciana	16
Open diapason	8
Stopped diapason, wd	8
Principal	4
Fifteenth	2
Mixture	III
Horn	8
Trumpet	8
Oboe	8
Clarion	4
Carillon(bells)	
Tuba mirabilis	8

Couplers, etc.

Gt. to Ped.	Sw. to Gt.
Sw. to Ped.	Ch. to Gt.
Solo Sw.	Solo Ch.
Pedal action	

Pedal(15 stops)

Open diapason, wd	32
Open diapason	32
Open diapason, wd	16
Open diapason	16
Open diapason	16
Bourdon	16
Principal	8
Twelfth	5 1/3
Mixture	III
Sesquialtera	V
Fifteenth	4
Trombone	32
Posaune	16
Trumpet	8
Clarion	4

Solo Choir

Open diapason
Stopped diapason
Hohl flöte
Harmonica
Stopped flute
Cornopean
Krumhorn

Solo Swell

Open diapason
Stopped diapason
Principal
Flageolet
Fifteenth
Horn
Trumpet
Hautboy
Clarion

Compass: Manuals, CC to F, 54 notes
Pedals, CCC to F, 30 notes

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11. SHIRE HALL, WORCESTER — Nicholson, 1844

Great(15 stops)

Great diapason	16
Open diapason	8
Open diapason, small	8
Gamba	8
Bourdon	8
Quint	5 1/3
Octave	4
Gemshorn	4
Wald flute	4
Twelfth	2 2/3
Fifteenth	2
Tierce	1 3/5
Mixture	V
Posaune	8
Clarion	4

Swell(15 stops)

Great diapason	16
Open diapason	8
Gamba	8
Stopped diapason	8
Keraulophon	8
Octave	4
Gambette	4
Wald flute	4
Super-octave	2
Mixture	V
Trombone	16
Cornopean	8
Hautboy	8
Clarionette	8
Clarion	4

Choir(11 stops)

Open diapason	8
Viol di gamba	8
Dulciana	8
Clarabella	8
Stopped diapason	8
Harmonic flute	4
Dulcet	4
Zimbe flute	4
Octave flute	2
Echo cornet	V
Trumpet	8

(continued overleaf)

(Specifications — Chapter Two — continued)

(Worcester Shire Hall: continued)

Pedal(12 stops)

Great diapason	32
Open diapason	16
Open diapason,small,wd	16
Dulciana	16
Violon	16
Bourdon	16
Quint stopped	10 2/3
Principal	8
Bass flute	8
Fifteenth	4
Mixture	III
Posaune	16

Couplers, etc.

Sw.to Gt.	Ped.Oct.
Sw.to Ch.	Sw.Oct.
Ch.to Gt.	Pedal organ, off or on
Gt.to Ped.	Tremulant Sw.
Ch.to Ped.	Sforzando pedal
Sw.to Ped.	Pneumatic lever attachment

10 Composition pedals

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12. ST.OLAVE'S, SOUTHWARK — Lincoln,1844 and Hill,1846

Great(25 stops)

Sub Bourdon(ten.C)	32
(Tenoroon) (Bourdon(1 oct.))	16
Unison,open	8
(Unison,Treble,closed) (Unison,Bass,closed)	8
Viol di gamba(ten.C)	8
Salcional(ten.C)	8
Clarabella(ten.C)	8
Quint	5 1/3
Octave	4
Wald flute(ten.C)	4
Decima	3 1/5
Duo Decimo	2 2/3
Super Octave	2
Piccolo(ten.C)	2
Octave decima	1 3/5
Sesquialtera	III
Mixture	II
Furniture	III
Doublette	II
Glockenspiel	II
Posaune	8
Clarion	4
Octave clarion	2
Cromhorne(ten.C)	8
Corno flute(Ten.C)	8

Couplers

Grand organ combined
Swell to Grand
Grand to Pedal
Swell to Pedal

Compass:

Great:	CC to F,	54 notes
Swell:	Tenor C to F,	42 notes
Pedal:	CCC to D,	27 notes

Swell(10 stops)

Tenoroon	16
Unison open	8
Unison closed	8
Octave	4
Suabe flute	4
Superoctave	2
Flageolet	2
Octave fifteenth	1
Cornopean	8
Hautbois	8

Pedal(3 stops)

Contra bourdon	32
Principal contra bass	16
Bass trombone	16

(Specifications — Chapter Two — continued)

13. ALL SAINTS', NORTHAMPTON — Hill, 1844

Great(16 stops)

Double open	16
Double stopped	16
Open diapason	8
Open diapason	8
Stopped diapason	8
Quint	5 1/3
Principal	4
Twelfth	2 2/3
Fifteenth	2
Sesquialtera	III
Doublette	II
Furniture	IV
Double trumpet	16
Posaune	8
Trumpet	8
Clarion	4

Swell(15 stops)

Double diapason	16
Open diapason	8
Stopped diapason	8
Dulciana	8
Principal	4
Twelfth	2 2/3
Fifteenth	2
Sesquialtera	III
Mixture	II
Contra fagotto	16
Cornopean	8
Trumpet	8
Oboe	8
Clarion	4
Flute (?Corno)	4

Choir(6 stops)

Dulciana	8
Stopped dulciana	8
Principal	4
Flute	4
Fifteenth	2
Cremona	8

Pedal(7 stops)

Open, wood	16
Sub (Bass)	16
Principal	8
Fifteenth	4
Sesquialtera	V
Trombone	16
Trumpet	8

Couplers:

Gt.to Ped.	Ch.to Ped.
Sw.to Ped.	Sw.to Gt.

Compass:

Manuals,	CC to F,	54 notes
Pedal,	CCC to D,	27 notes

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14. ASHTON-UNDER-LYNE PARISH CHURCH — Hill, 1845

Great(18 stops)

(Tenoroon diapason) (Bourdon(1 oct.))	16
Open diapason	8
Open diapason	8
(Stopped diapason(ten.C) (Stopped diapason, bass)	8
Quint	5 1/3
Principal	4
Wald flute(ten.C)	4
Tenth	
Twelfth	2 2/3
Fifteenth	2
Tierce	1 3/5
Sesquialtera	III
Mixture	III
Doublette	II
(Tenoroon trumpet) (Double trumpet) (1 oct.))	16
Posaune	8
Clarion	4
Octave clarion	2

Choir(9 stops)

Open diapason	8
Claribel(ten.C)	8
(Viol de gamba(ten.C)) (Stopped diapason,) bass)	8
Principal	4
Oboe flute(ten.C)	4
Stopped flute(ten.C)	4
Fifteenth	2
Piccolo(ten.C)	2
Cremona(ten.C)	8

(continued overleaf)

(Specifications — Chapter Two — continued)

(Ashton-under-Lyne Parish Church, continued)

Swell(16 stops)

(Tenoroon dulciana) / (Bourdon(1 oct.))	16	Flageolet(ten.C)	2	Open diapason	16
Open diapason	8	Sesquialtera	III	Bourdon	16
Echo dulciana(ten.C)	8	Mixture	II	Principal	8
(Stopped diapason,treble) / (Stopped diapason,bass)	8	Echo dulciana cornet (ten.C)	V	Fifteenth	4
Principal	4	Tenoroon trumpet (ten.C)	16	Mixture	V
Dumbo flute(ten.C)	4	Cornopean	8	Trombone	16
Twelfth	2 2/3	Oboe	8		
Fifteenth	2	Clarion	4		

Pedal(6 stops) — Open diapason 16, Bourdon 16, Principal 8, Fifteenth 4, Mixture V, Trombone 16

8 couplers
6 composition pedals
Sforzando pedal

Compass: Manuals, CC to F, 54 notes
Pedals, CCC to D, 27 notes

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15. ST.MICHAEL'S, CHESTER SQUARE — Robson, 1847

Great(12 stops)

Double stopped diapason	16
Open diapason	8
Stopped diapason	8
Principal	4
Flute(open,wood)	4
Twelfth	2 2/3
Fifteenth	2
Piccolo(wood,open)	2
Sesquialtera	III
Mixture	II
Trumpet	8
Clarion	4

Pedal(3 stops)

Open diapason	16
Stopped diapason	16
Trombone,metal	16

Swell(12 stops)

Double dulciana	16
Open diapason	8
Stopped diapason	8
Principal	4
Celestina	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Double bassoon	16
Horn	8
Hautboy	8
Clarion	4

Choir(9 stops)

Dulciana	8
Viol di gamba	8
(Stopped diapason, treble) / (Stopped diapason, bass)	8
Principal	4
Flute	4
Fifteenth	2
Furniture	II
Bassoon,throughout	8
Clarionet and Corno di bassetto	8

Couplers: Gt.to Ped. Sw.to Gt.
Sw.to Ch. Ch.to Ped.
Ped.oct. 3 composition pedals

Compass: Manuals, CC to G, 56 notes
Pedals, CCC to F, 30 notes

(Specifications — Chapter Two — continued)

16. RADLEY COLLEGE CHAPEL, BERKSHIRE — Telford, 1848

Great(16 stops)

Double open diapason	16
Open diapason,great	8
Open diapason,small	8
Stopped diapason	8
Quint	5 1/3
Principal,great	4
Principal,small	4
Tenth	3
Twelfth	2 2/3
Octave flute	2
Fifteenth	2
Sesquialtera	IV
Mixture	III
Double trumpet	16
Trumpet	8
Clarion	4

Compass:
Manuals,CC to C,61 notes
Pedals,CCC to G,32 notes

Swell(13 stops)

Double diapason	16
Open diapason	8
Dulciana	8
Stopped diapason	8
Principal,great	4
Principal,small	4
Twelfth	2 2/3
Fifteenth	2
Twenty-second	1
Sesquialtera	III
Cornet	III
Trumpet	8
Oboe	8

Couplers

Sw.to Gt.
Sw.to Ch.
Sw.to Ped.
Gt.to Ped.
6 composition pedals

Choir(7 stops)

Stopped diapason	8
Dulciana	8
Viol da gamba	8
Principal	4
Wald flute	4
Fifteenth	2
Cremona	8

Pedal(8 stops)

Double open diapason	16
Double open diapason	16
Open diapason	8
Principal	4
Twelfth	2 2/3
Sesquialtera	IV
Double trumpet	16
Trumpet	8

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17. CENTENARY CHAPEL, BOSTON — Gray and Davison,1850

Great(14 stops)

Double open diapason	16
Open diapason	8
Open diapason	8
Stopped diapason	8
Quint	5 1/3
Octave	4
Flute	4
Octave quint	2 2/3
Superoctave	2
Flageolet	2
Sesquialtera	III
Furniture	III
Posaune	8
Clarion	4

Swell(10 stops)

Bourdon	16
Open diapason	8
Stopped diapason	8
Octave	4
Super Octave	2
Sesquialtera	III
Contra fagotto	16
Cornopean	8
Oboe	8
Clarion	4

Choir(12 stops)

Open diapason	8
Gamba	8
(Keraulophon) (Stopped diapason, bass)	8
Clarionet flute	8
Octave	4
Flute	4
Gemshorn	4
Superoctave	2
Flageolet	2
Sesquialtera	III
Corno di Bassetto	8

(continued overleaf)

(Specifications — Chapter Two — continued)

(Centenary Chapel, Boston: continued)

Pedal(6 stops)

Grand open diapason	16
Grand violon	16
Grand bourdon	16
Grand octave	8
Grand Super Octave	4
Grand trombone	16

Couplers,etc.

Sw.to Gt.	Gt.to Ped.
Ch.to Gt.	Ch.to Ped.
Sw.to Ch.	Sforzando pedal.
Sw.to Ped.	

Compass

Manuals: CC to F, 54 notes.

Pedals: CCC to F, 30 notes.

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18. COLLEGIATE INSTITUTION, LIVERPOOL — Jackson,1850

Great(12 stops)

(Tenoroon) (Bourdon(1 oct.))	16
Great open diapason	8
Small open diapason	8
Stopped diapason	8
Principal	4
Twelfth	2 2/3
Fifteenth	2
Sharp twentieth	1 1/7
Sesquialtera	III
Mixture	III
Trumpet	8
Clarion	4

Compass:

Manuals, CC to G, 56 notes

Pedals, CCC to G, 32 notes

Swell(9 stops)

Double diapason	16
Open diapason	8
Stopped diapason	8
Principal	4
Fifteenth	2
Echo dulciana cornet	V
Cornopean	8
Oboe	8
Clarion	4

Couplers,etc.

Sw.to Gt.
Ch.to Sw.
Suboct.Ch.to Gt.
Sw.to Ped.
Ch.to Ped.
Gt.to Ped.
Superoct.Ped.

6 composition pedals.

Choir(11 stops)

Open diapason	8
Stopped diapason	8
Clarabella	8
Keraulophon	8
Dulciana	8
Principal	4
Flute	4
Piccolo	2
Fifteenth	2
Bassoon	8
Clarionet	8

Pedal(7 stops)

Great open diapason	16
Bourdon	16
Principal	8
Twelfth	5 1/3
Fifteenth	4
Mixture	VI
Posaune	16

(Specifications — Chapter Two — concluded)

19. BUXTON ROAD CHAPEL, HUDDERSFIELD — Robson, 1850

Great (15 stops)

Double open diapason	16
Large open diapason	8
Open diapason	8
Stopped diapason	8
Quint	5 1/3
Principal	4
Wald flute	4
Twelfth	2 2/3
Fifteenth	2
Piccolo	2
Sesquialtera	III
Mixture	II
Furniture	III
Trumpet	8
Clarion	4

Compass:
Manuals, CC to C, 61 notes.
Pedals, CCC to F, 30 notes.

Swell (12 stops)

Double diapason	16
Open diapason	8
Stopped diapason	8
Viol di gamba	8
Principal	4
Fifteenth	2
Sesquialtera	III
Contra fagotto	16
Clarionet & Corno di bassetto	8
Hautboy	8
Horn	8
Clarion	4

Couplers, etc.
Swell to Great
Great to Pedals
Choir to Pedals
Octave Pedals
6 composition pedals.

Choir (4 stops)

Stopped diapason & Claribella	8
Dulciana	8
Viol de gamba	8
Principal	4

Pedal (9 stops)

Open diapason	16
Violone	16
Principal	8
Quint	5 1/3
Fifteenth	4
Sesquialtera	V
Posaune	16
Trumpet	8
Clarion	4

(each stop has
(an extra octave
(of pipes, for the
(octave coupler.

-o-o-o-o-o-o-o-

CHAPTER THREE — 1851 TO 1875.

General trends during the third quarter-century

The twenty-five-year period which we now enter was one in which the wonderful progress recorded in Chapter Two is continued and consolidated. General growth in size in all departments brings with it a consequent spate of mechanical improvements and developments. The console takes on the appearance which, basically, it has retained ever since. The Great and Swell are confirmed in their separate personalities, the one based on a complete flue-chorus, the other on a predominantly reed ensemble in which the improved techniques of heavy-pressure reed voicing put a completely new aspect on reed tone-production. The Pedal department becomes much larger and more important; and a number of organs include the new, independent Solo division on its own fourth manual. Even the Choir assumes a slightly more coherent appearance in several cases, but the improvement, as Chapter Four will show, is short-lived.

This is the era of the large Concert-instrument. St.George's Hall, Leeds Town Hall, Crystal Palace, Alexandra Palace and the Royal Albert Hall bring the size of the organ up to eighty, ninety, a hundred stops; and three out of these five are the work of the man who dominates the second half of the century as William Hill did most of the first half: Henry Willis. His success sprang from the 1851 Hyde Park Exhibition, to which institution a great debt of gratitude is owed by British organ-building, not only for the opportunity it gave to Willis (which he was not slow to grasp) and to other builders also, but for its introduction into England of the work of Edmund Schulze. Although the number of organs actually built by him in the country was not large, his influence was an immense power for good; and another useful foreign transfusion into the life-blood of British organ-building was supplied by the Frenchman, Aristide Cavaillé-Coll.

Undoubtedly the various processes of improvement were hastened by the organ's being brought out from its ecclesiastical obscurity into the full glare of the Concert-hall; its wider use as a recital instrument made it necessary that everything possible should be done for the player's physical and aural comfort. Better action-mechanism went hand-in-hand with widespread conversions to equal-temperament tuning; the radiating-concave pedalboard made pedalling easier, and the modern conception of the detached console enabled its few fortunate possessors to hear, truly and accurately, the music they were producing, instead of the clicking of the action and the rush of air at the pipemouths which formerly crowded round them as they played.

Electricity's early failings caused a brief setback in public favour, but the important point is that it arrived and was tried out, for better or for worse; and by the end of the century its manifest possibilities were acknowledged by those that had eyes to see and ears to hear (not such a large section of the community of organists as one could wish !) and it was here to stay.

<u>The Great Organ</u>

The development of the Great now follows steadily along the lines initiated in the period covered by Chapter Two. The complete build-up of the flue-chorus is regarded as being of paramount importance, and even a moderate-sized Great of about ten stops will in the majority of cases have both double and mixture. To illustrate more precisely the extent of the pendulum's swing away from the earlier over-generous allowance of upperwork and absence of sub-unison foundation tone, a few statistics may be quoted, derived from the study of nearly two hundred tonal schemes of large and small organs which were built or rebuilt during this twenty-five-year period.

Among eleven-stop Greats, the flue-chorus is complete from double to mixture in 83% of cases; in ten-stop Greats, 64%; in nine-stop Greats, 47%; and in eight-stop Greats 55%. Several builders, notably Henry Willis, showed again and again how effective a chorus could be derived from a mere handful of stops; and it seems clear that, where it was necessary for the Great to be restricted in size, the achieving of a satisfactory diapason ensemble was the primary objective. Next to this came the provision of a secondary chorus, often founded on flute or string tone, though these did not go beyond 8ft and 4ft pitch except in the larger instruments. The reed section was third in the list of priorities; the general attitude seems to have been (quite correctly) that a complete 16, 8 and 4ft reed-chorus was an admirable thing to have, <u>provided</u> that the other priorities had been fulfilled. Thus we find that there are very few fifteen-stop Greats which do not include the whole reed family; and conversely, very few of under fifteen stops which do. However, among these very few latter examples (six, to be exact), there were some wonderfully comprehensive twelve- and thirteen-stop designs which will be discussed in the succeeding pages.

The great Exhibition of 1851 attracted a number of British and foreign organ-builders, with several important consequences for the craft. There were only three organs of any size, one of them being a very complete thirty-eight-stop four-manual by J.M.Corps of London, and later of Reading. This organ (which afterwards found its way to a Scarborough Church, All Saints', in 1874) showed tremendous promise which unfortunately does not seem to have been fulfilled, for the name of Corps occurs but seldom in the subsequent annals of organ-building. Its nine-stop Great had the right ideas — flue double, unison open and stopped diapasons and gamba (note the three distinct tone qualities), 4ft principal and harmonic flute, and two mixtures, one of them comprising the twelfth and fifteenth. There was only one reed, but the organ was amply equipped with reeds in the other departments.

Gray and Davison exhibited a three-manual of thirty-four stops; its thirteen-stop Great had nine stops from 16ft to 2ft, as well as five ranks of mixtures and reeds of 8ft and 4ft. The three unisons were two open and a stopped diapason; and this trio became almost the standard unison stops on most small-to-medium Greats, the second open being usually of slightly smaller scale and often with a touch of string in its tonal make-up. But these two organs, for all their many excellent qualities, were overshadowed by an instrument which was by far the largest of the Exhibition's organs, and which is best described in the words of the "Illustrated Exhibitor Guide" — words which read rather quaintly to us nowadays.

"This large leviathan" says the Guide redundantly, "rears its lofty structure at the western end of the gallery. This gigantic instrument is of the largest class of church organ, and is built by a young London maker who doubtless seeks to make his fame by this great effort. It is constructed somewhat after the German model, and has three claviers CC to G, and 2½ octaves of pedals, with seven couplers. The great organ has 20 stops, with 1456 pipes. Swell organ, 22 stops, 1682 pipes. Choir organ, 14 stops, 760 pipes. Pedal organ, 14 stops, 576 pipes. Total pipes, 4474. Barker lever action. The organ is technically erected as a 32-foot instrument. From what we have heard and examined, we are disposed to augur favourably of the capabilities of the instrument."

The "young London maker" so patronisingly described was, of course, Henry Willis, then in his thirty-first year. Much later in life, he described his Gloucester organ of 1847 as his "stepping-stone to fame", but that was a rebuild only, albeit a comprehensive one. The Exhibition organ, on the other hand, was "all his own work", and

and it was directly due to this that he obtained the contract to build the great new instrument in St.George's Hall, Liverpool, which set him firmly and beyond dispute at the top of his profession. The greater part of his Exhibition organ was re-erected in Winchester Cathedral in 1854; in the process of trasfer, it suffered a sea-change from a three-manual of seventy stops into a four-manual of forty-eight.

William Hill had no need of advertisement by this time, and he was content to exhibit a small "shop-window" two-manual in order to display certain mechanical and tonal improvements of his own invention. Nevertheless the Great had a complete seven-stop flue-chorus plus a chorus-reed and a krumhorn (i.e. clarinet). This latter stop was now often to be found as an extra reed on the Great of any two-manual with pretensions to completeness, and it provided a useful quiet solo reed to be used against Swell accompaniment.

Among the three foreign organs, the most important was a nineteen-stop two-manual by the firm of J.F.Schulze (father of Edmund) of Paulinzelle in Germany. Here again, there were seven flue stops, progressing from 16ft up to five-rank mixture. The four unisons were all of distinctive tone-colour –– diapason ("principal"), string ("gamba"), and two different flutes ("hohlflöte" and the "gedeckt" or German stopped diapason, which was to become such a popular register on Swell and Choir in a smaller-scaled, quieter version known as "lieblich gedeckt"). Schulze was to have a powerful influence on British flue-voicing and tonal design generally; and though he built only a handful of organs in this country, each one of them has become almost a national treasure, an object of pilgrimage among organists; and his influence was to be further extended by his disciple T.C.Lewis.

Mention of Schulze turns the mind towards Doncaster, where his magnum opus was to be built a decade later. Now, however, in 1852 it was Hill who was entrusted with the rebuilding of the Parish Church organ there, which a number of local builders had enlarged at one time or another until it became, in Hill's hands, one of the largest in the country; in fact, with its fifty stops, it was inferior in size only to the York Minster and Willis Exhibition organs, and the 1843 Birmingham rebuild. As Hopkins wrote:

1) "It was the first organ erected in this country in which the Continental system was carried out in its integrity, of placing three complete 16ft or Double stops, and a Quint of 5 1/3ft on the Great manual.......the Great organ was a 16ft manual in the German acceptation of the term, the tone of which was supported by a 32ft pedal".

But the reader will remember, what Dr.Hopkins has overlooked,
2) that at least five organs during the forties had two manual doubles and the quint, while one had three doubles. Of these organs, two were supported by a 32ft pedal. Four of them, in any case, were by Hill, so that in gently pointing-out Hopkins' oversight, we are not diminishing the value of Hill's Doncaster achievement; rather is it

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1. Hopkins and Rimbault, p.529
2. Birmingham Town Hall: All Saints', Northampton (with three doubles): St.Olave's,Southwark: Ashton-under-Lyne Parish Church: and Radley College.

increased by having occurred several years earlier than the date for which Hopkins gives him credit.

The Doncaster Great, of twenty stops, had sixteen flues (double to tierce, with thirteen mixture ranks and a Mounted Cornet) and four reeds. The design was harmonically very thorough, but with strong emphasis on the open diapason; flute tone existed only in 16ft and 8ft pitches. This splendid instrument did not last long, however, for it was destroyed by fire early in 1853, together with the church in which it stood. But this particular cloud had its pure-silver lining in the opportunity it gave to Schulze, and in the object-lesson which he there provided for British builders and designers.

A large and well-equipped Great was produced by Gray and Davison in their Glasgow City Hall organ in 1853; its sixteen stops comprised diapason and flute choruses up to 2ft in each case, with six ranks of mixture; and there was a novel development in the shape of 1) a separate, higher-winded soundboard on which stood the harmonic flutes and chorus reeds in 8ft and 4ft pitches; and these four stops could be transferred to the Swell by means of a pedal if so required. This experiment — which is not to be confused with the "divided Great" ventures which are referred to later — was interesting at the time, but it was not imitated because the separate Solo department on the fourth manual was taking-over the duties for which Gray and Davison designed their "floating" flute and reed section.

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1. This was actually the second instance of this type of floating group of stops: the first, by Lincoln in 1843, was mentioned on page 81.

There now begin to be growing indications that builders are not always satisfied to limit themselves to the "standard" two opens and a stopped diapason as their unison foundational stops in instruments of more than moderate size; the dulciana and salicional appear quite often, and the gamba regularly in larger schemes. Occasionally we meet such stops as the Clarinet flute (Catholic Apostolic Church, Bloomsbury — Gray and Davison, 1855) and the Hohl diapason (St.Martin-in-the-Fields — Bevington, 1854).

Another large and famous concert-organ, with a fifteen-stop Great that must have had a powerful and brilliant ensemble, was that built by Hill for the Royal Panopticon of Science and Art in Leicester Square, and later set up in the South Transept of St.Paul's Cathedral — where its many percussions must have been most tempting to light-hearted articled pupils; but surely we dare not echo Scholes, who
1) impiously hopes that "Sir John Goss was discreet in the use of the drums, triangles, tambourines, etc., which were included in its specification."

Apart from these exotic delicacies, there was a very sound and comprehensive Great flue and reed build-up; and another thoroughly satisfactory plan was the thirteen-stop Great at Winchester Cathedral, extracted by Willis from his Exhibition "leviathan" in 1854. All these, however, were put utterly in the shade by Willis' 100-stop instrument at St.George's Hall, Liverpool in 1855, with its twenty-

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1. P.A.Scholes, "The Mirror of Music", p.585.

five stops on the Great alone. A study of the specification, given at the end of this chapter, will show that its six unison flues included Flute à Pavillon, Lieblich Gedackt and Violoncello; the 4ft stops contained flute and string tone as well as diapason; ample mutations led up to eleven ranks of mixtures; and six chorus-reeds supplied the final climax, including among their number three different unison reeds — trombone, ophicleide and trumpet.

The story of how he secured the Liverpool contract was entertainingly related by Willis himself more than forty years later; and some extracts from his account are worthy of reproduction here. Even at the age of thirty-one, "Father" Willis displays a shrewd business acumen which, almost as much as the fine qualities of his organ, seems to have contributed greatly to his success in this transaction.

1) "The Town Clerk of Liverpool" Willis begins, "wrote to me to the effect that a committee of the Corporation would visit the Exhibition on a certain day at 6 a.m., their object being to test the various organs with a view to selecting a builder for the proposed new instrument at St.George's Hall. He asked me if I would be there. I was there — all there ! The other two competing builders, X and Z, in anticipation of the visit, tuned their organs in the afternoon of the previous day, with the result that, owing to the abnormal heat of the sun through the glass roof, the reeds were not fit to be heard ! I said nothing. At five o'clock on the following morning, my men and I were there to tune the reeds

1. "Musical Times", May 1898.

of my organ in the cool of the morning of that lovely summer's day.

"At six o'clock, the Liverpool committee, which included the Mayor and the Town Clerk, in addition to S.S.Wesley and T.A.Walmisley, their musical advisers, duly appeared. Messrs X and Messrs Z had specially engaged two eminent organists to play for them. I retained nobody. But I had previously said to Best, who had given several recitals on my organ at the Exhibition, 'It would not be half a bad plan if you would attend to-morrow morning at six o'clock, as you usually do for practice.' Best was there.

"After the two other organs had been tried, the Town Clerk.... ....came up and said: 'We have come to hear your organ, Mr.Willis. Are you going to play it yourself ?' 'Do you expect an organ-builder to play his own instrument ?' I replied. 'If I had known that the other builders had specially engaged two organists to play their instruments, I might have done the same. Why don't you ask Wesley or Walmisley ? They should be made to play, unless one is afraid of the other.' As Wesley and Walmisley declined to perform, I said.....'There's one of your townsmen standing there (that was Best), ask him.'......'Mr.Best has no objection to play' said the Town Clerk, 'but he wants five guineas !' 'Well, give it him, the Corporation can well afford it.'

"The matter was arranged, and I said to Best: 'Now, in order that everything shall be quite fair and square, would you mind playing the same piece on all three organs ?' 'What shall it be ?' asked S.T.B. 'The overture to "Jessonda"' (I was always a great Spohr man). While Best was playing the overture on the other two instruments, the specially engaged organists stood on each side of him to manipulate the stops, etc. Meanwhile, my brother, who was a clever, quick tuner, again went over the trebles of the reeds, and everything was as trim as could be. When Best came to play my organ, he politely declined the similar kind help the two organists had rendered him at the other two instruments, as he was perfectly familiar with my pistons, stop arrangements, etc. It was a splendid performance, and I was told that the organ was quite a revelation to those Liverpudlians.

"The committee retired to deliberate in private, but only for twenty minutes, when Wesley came up to me and said: 'I am very happy to tell you that the delegates of the Corporation have decided to recommend you to build their organ.' I was perfectly cool and collected, and feeling very hungry I went to get some breakfast with Henry Smart, who was present."

A new firm that began to come into prominence in the fifties was Messrs Kirtland and Jardine of Manchester. At a time when four-manual organs could still be counted on one's fingers, they erected two splendidly-designed specimens in their own city, at Holy Trinity and St.Peter's Churches. More will be said of the former at a later stage in this chapter. The latter (1856) had an admirable sixteen-stop Great, with five well-varied unisons; and in general it showed strong signs of St.George's Hall influence. The same builders followed this by another outstanding scheme a year later at the Free Trade Hall; again variety of build-up was achieved, with strings and flutes of both 8ft and 4ft pitches over and above the main diapason chorus.

The year 1857 brings an echo of the Exhibition, in the opening of Gray and Davison's new organ in a very famous building, the Crystal Palace; for this was the building that had housed the Hyde Park Exhibition and that was now re-erected at Sydenham in South London. The two flue doubles on the Great were both open stops — diapason and dulciana — which was an unusual feature; and there was a flute family which was carried up to the 2ft flageolet harmonique. This type of stop, the harmonic flute, was growing in general favour; and it seems the appropriate moment now to say a few words about harmonic flutes and reeds, which had spread across the Channel from the workshops of their inventor, Cavaillé-Coll, some few years earlier.

It was in his celebrated organ at St.Denis in 1841 that Cavaillé had first made use of the principal of harmonic pipes, i.e. the piercing of open flue pipes halfway up their length with one or more small holes. These caused the vibrating air-column to split in half, so that the pipe produced its first harmonic — the octave — instead of the fundamental. Thus harmonic pipes had to be double the length of the normal open pipe for the given note; that is to say, a 2ft open pipe would sound middle C, but a middle C harmonic pipe must needs be of 4ft length. Usually it was only the treble portion of a stop which was so treated, with the idea of achieving greater power and brilliance in that register; and the most common of harmonic stops were of the flute type. Cavaillé-Coll also introduced harmonic reeds on heavier wind-pressure, but it was Henry Willis' brother George, a great reed-voicer, who made the most effective use of this technique, as will be seen later.

Henry Willis was the first British builder to use the harmonic flute when he installed a 4ft specimen on the Great at Tewkesbury Abbey (1848) in his rebuild of the "Milton" organ there, and again at the old Surrey Chapel in 1850. The enterprising Gorps had one in his Exhibition organ, and a year later Kirtland and Jardine included one in the Solo department at Holy Trinity, Manchester. It will be observed that all these stops were of 4ft pitch, though Cavaillé-Coll had used 8ft pitch for both harmonic flutes and harmonic reeds. Wedgwood, however, points out that:

1) "In 4ft pitch on the Great it forms a stop invaluable for accompanimental usage, and, provided it is not unduly powerful, beneficial in combination. In 8ft pitch it is not very suitable for the Great organ, for, if sufficiently powerful to be serviceable it is apt to render the diapason tone 'muddy', and certainly does not supply as much body and 'filling'-power as a Hohlflöte or Tibia."

Be that as it may, Gray and Davison had an 8ft harmonic flute in two of their notable organs in the fifties: Glasgow City Hall

1. Wedgwood, op.cit., p.86

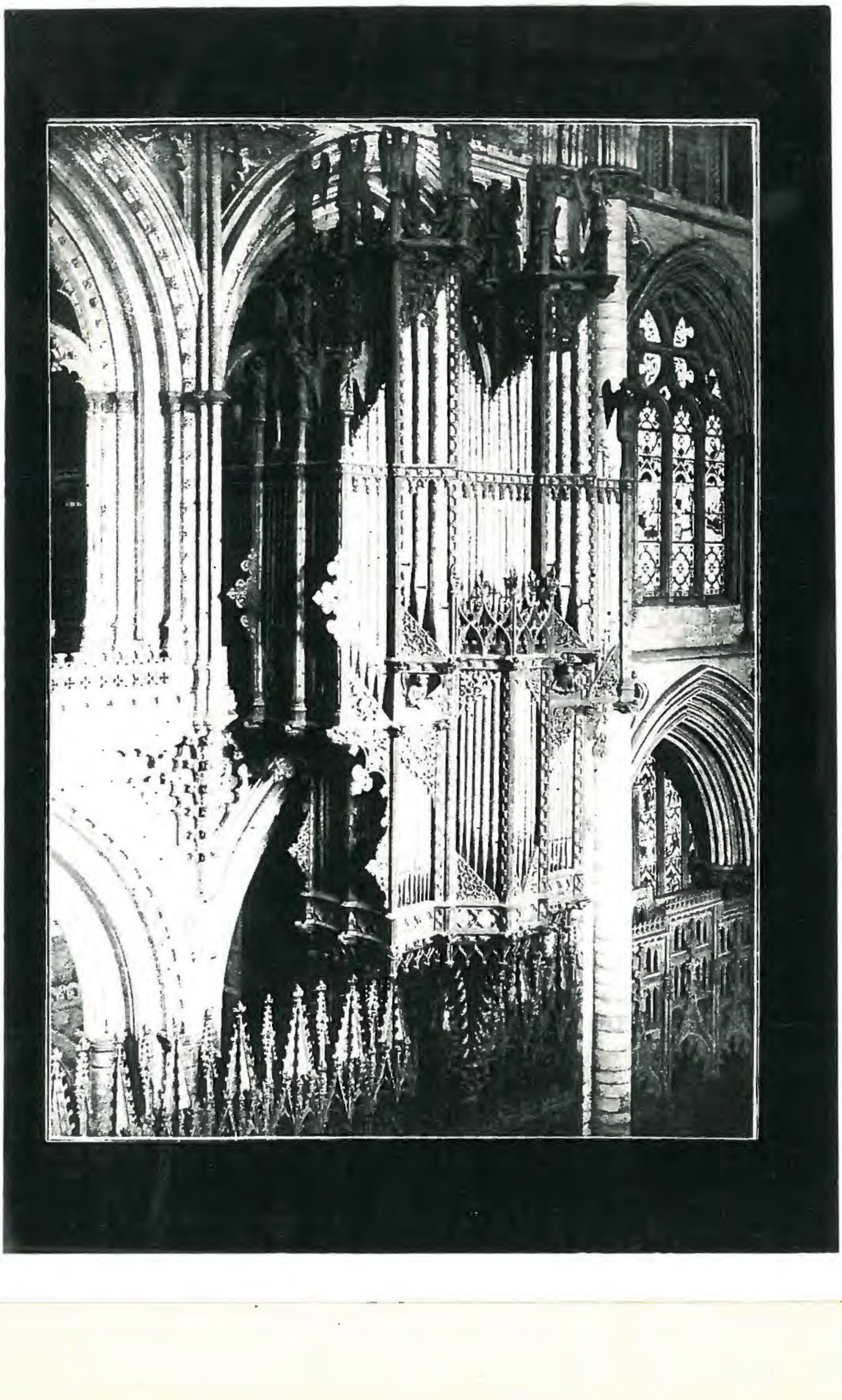

PLATE VII.

Ely Cathedral: Gilbert Scott's organ-case.

Sir Gilbert Scott, perhaps the greatest church architect of the century, deserves great credit for realising — and demonstrating to others — that organs should be attractive to the eye as well as to the ear. He made a thorough study of the great Continental examples; and, as a result, we have this case which he designed for Ely in 1851, plainly inspired by the magnificent late Gothic case in Strasbourg Cathedral. It is generally accepted as being the best of Scott's surviving cases. His son, John Oldrid Scott, carried the art of organ-case design to new heights of beauty and originality.

(Photograph from Org.27.145, by Ernest E. Alcock)

has already been mentioned, with its separate "floating" 8ft and 4ft harmonic flutes and reeds on their own high-pressure soundboard (1855). At Magdalen College, Oxford, there was an 8ft example on the Solo, in 1855. The 2ft harmonic piccolo or flageolet began to occur in larger instruments now; and Willis, who introduced it into the Solo at St. George's Hall, remained most faithful to it and to the 4ft stop henceforward. Another Willis innovation was a 4ft Trompette harmonique as one of the four heavy-pressure reeds on the last-named organ. Less promising was the Harmonic open diapason, which Kirtland and Jardine brought out at St.Peter's, Manchester in 1856. This was a type of stop which was seemingly never a success — though a number of attempts were made during the remainder of the century — for it could not be persuaded to blend with its neighbours. Wedgwood, in descri-
1) bing it as "raucous and self-assertive", points out that the leathered diapason and stops of the tibia type eventually made far more satisfactory substitutes.

The Crystal Palace organ, besides a liberal equipment of harmonic flutes on Great, Swell and Solo organs, had a so-called "Trumpet harmonique" on the Great. Even in the traditionally Babel-like atmosphere of organ-stop nomenclature, this juxtaposition of English noun and French adjective is hard to swallow, and is fortunately of rare occurrence. However, this reed-chorus at the Palace must have been splendid in its effect, topped by a 2ft reed such as Hill had earlier

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1. Wedgwood, op.cit., p.86.

used at Birmingham. Yet another great concert-hall organ emerged from the Gray and Davison factory in 1858; it was their magnum opus, the 92-stop instrument installed in the new City Hall at Leeds to the design of Henry Smart and William Spark, and it was remarkable not only for its size, but for the ingenuity and progressiveness of its tonal and mechanical plan. The latter feature will be discussed in its proper place in the chapter: while the tonal scheme may best be described in the words of Dr. Hopkins:

1) "In the Great organ" writes the Doctor, "there are some excellent features of arrangement. The idea of dividing the the Great into two distinct masses is not altogether novel; a similar distribution has been at least hinted at in two or three Continental examples. In the present instance, however, the principle has been developed, and the various resources it affords have been made available to a far greater extent than appears to have been contemplated in any other case.

"The twelve stops placed on the 'front' sound-boards are calculated to form a comparatively light, though powerful and brilliant organ, while the remaining fourteen stops placed on the 'back' sound-boards, comprising some of the strongest members of the flue-work — the flute à pavillon, the viola, and the harmonic series of 8, 4 and 2ft pitch, together with the quint, the large mixtures, and the heavy reeds, will form a 'band' entirely different to the foregoing" (tut, Dr.Hopkins !) "in amount and quality of force.

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1. Hopkins and Rimbault, pp.519-20.

"There is a pedal, numbered 4 in the list of pedals for 'mechanical adjustment', which operates on stop-valves placed in the wind-trunks of the 'back' sound-boards, or in other words discharges the function of what the Dutch and German builders call a 'wind-coupler'. So long as this pedal remains hitched down, allthe twenty-six stops are at the performer's disposal on the Great organ clavier; while the act of releasing this pedal instantaneously cuts off the wind-supply from the stops of the 'back' sound-boards, and thus severs them from the control of the keys.

"Hence, then, by the use of this pedal, all or any of the stops of the 'back' sound-boards may be instantaneously added to the whole or any part of the 'front' Great organ; thus providing -- (besides numerous other effects depending on the stops at the moment in use -- the most rapid and perfect sforzando possible. There is, besides, another pedal numbered 5 in the same list, the operation of which, on being hitched down, is to disconnect the stops of the 'back' soundboards from the Great, and couple them to the Swell clavier -- thus rendering the two portions of the Great organ separately disposable on different claviers, and suggesting a host of novel combinations, of which the modern race of organists will not be slow to avail themselves.........

"Taking the proportions of the flue-stops alone, they stand thus: two stops of 16ft, six of 8ft, one of 6ft, four of 4ft, one of 3ft, two of 2ft, and sixteen ranks of mixture. To this, add the reeds, namely: one of 16ft, three of 8ft, and two of 4ft........ Throughout all this, there are no vain repetitions of similar scales and qualities. For example, the six stops which compose the 8ft pitch of the flue-work are an open diapason (of the Old English class), a gamba (of the conical description), a bourdon, a flute à pavillon, a viola (the largest and most powerful of the German kind known as 'string-toned stops'), and a flute harmonique. The same care is exercised throughout the remainder of the flue-work, not omitting the four mixture-stops, the scales and compositions of which are studiously varied with reference to the particular part contemplated for each in the general effect. In the reed work also of this manual, a similar variety is observed. The trumpet and clarion of the 'front' Great organ are intended to follow as nearly as possible the model of that brilliant, clangy, description of reeds which Byfield made so deservedly famous — a quality, by the way, far too much neglected of late years in this country; while in the 'back' Great organ, the modern English style of reed-work has been adopted for the contra trombone, trombone and tenor trombone; and the most successful achievement of the French school has its representative in the harmonic trumpet. Under all these circumstances, then, of quantity and variety, there can be no doubt that, as a single manual, this Great organ has very few rivals in Europe."

The next important "landmark" was also in Yorkshire, in Sir Gilbert Scott's impressive reconstruction of the Parish Church at Doncaster, where an organ of practically the same size as that of Leeds — but of very different design — was installed by Edmund Schulze. It was through his work, and through this example of it in particular, that the main stream of German organ-building, which had already exerted a considerable influence at second-hand, was able to mingle directly with the rising tide of the craft in Britain, and to bring into our midst a number of notable instruments. These in their turn taught our native builders an invaluable series of first-hand lessons in the voicing of individual stops and in the designing of whole departments, on both large and small scales.

The little organ which Schulze had exhibited in 1851 (afterwards acquired by the Northampton Corporation, who proved unworthy custodians and allowed it to disappear into the limbo of forgotten things) had already borne fruit. He had been called upon to collaborate with Hill in building the large new organ in the Parish Church at Leeds in 1859. He himself was responsible for the Great (fifteen stops, including two flue doubles, eight mixture ranks, and a 16,8,8,4 reed quartet) and the Solo. He also supplied about a dozen stops in Robson's rebuild of the Temple Church organ in 1862, thanks to Dr.Hopkins' admiration for the tonal beauty of his work.

However, before we embark on further discussion of Schulze's

work, a brief reference must be made to Hill's organ at Edinburgh University (1861), where the twelve-stop Great — of sound and complete design, apart from the absence of a double reed — contained
1) a Harmonic mixture, of Tenor C compass, consisting of fourteen ranks. This, to use athletic parlance, still remains a British record, its nearest rival being the ten-rank Grand Chorus at Liverpool Cathedral (Willis, 1926).

Schulze's ninety-three-stop five-manual organ at Doncaster in 1862 was another of the great milestones on our journey through this century of organ-building. The Schulze diapason and the Schulze flue-chorus were absolutely new departures in voicing and design. The detailed specification of the twenty stops in the Doncaster Great can be examined at the end of this chapter; here, it will suffice to draw attention to the 32ft and two 16ft flue-stops, the four unisons, the six stops from 5 1/3ft up to 2ft, and the fourteen ranks of mixtures. The reeds, which were not on increased wind-pressure, were the least satisfactory side of Schulze's work, but such was the glory of the flue-chorus that the weakness of the reeds mattered little; it has often been felt that the ideal Great would combine Schulze flues with Willis reeds.

A very comprehensive, yet concise, summary of the development of the diapason may be quoted here from a recent book on tonal design, as it places Schulze clearly in his proper perspective:

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1. This mixture was, we are told, "inserted by Professor Donaldson for merely acoustic purposes". (E.M. Oakeley, "Life of Sir Herbert Oakeley", p.157)

1) "There have been three important stages in the development of the Diapason and its chorus. The ancient type of mild and generally flutey Diapason prevailed until the nineteenth century. The transition from the ancient to the modern culminated in the relatively powerful and bright-toned diapason of Edmund Schulze, with its brilliant chorus. This, in turn, led on to the more powerful and foundational English Diapason.

"The tonal character of a Diapason pipe is largely determined by the scale, or diameter, of the pipe relative to its length, and by the pressure and quantity of wind admitted to it. Light pressure and large scales tend to a flutey quality of tone, while brilliancy is encouraged by heavier pressure and small scales. The inter-relationship of these important factors, and many others, in the actual finishing or voicing of the pipes, constitutes the art of the organ-builder.

"Whether by choice, or of necessity arising from the difficulty of raising adequate supplies of wind, the early organs were very lightly winded. A pressure of three inches was rarely exceeded, and the footholes of the pipes were small, especially in the basses, though the trebles, which consume less wind, were often boldly treated. As a result, the tone of the early Diapason had three outstanding characteristics:

"(a) it was usually more foundational or flutey, and softer,

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1. C.Clutton and G.Dixon: "The Organ — its tonal structure and registration", pp.16-18.

than modern Diapasons;

(b) it spoke with remarkable promptitude;

(c) and owing to the relatively bold trebles it had good melodic ability.

"This latter attribute is most important if an organ is not to produce a muddled effect, and many organs of this and the last century are notably deficient in melodic ability. The quality of quick speech is pleasing in conjunction with the fresh, unspoiled tone of the early Diapasons, though it would not be pleasant in conjunction with the powerful tone of a modern English Diapason. But it is an important aid to clarity when playing polyphonic music. The widespread prevalence of second-rate pneumatic actions seems to have dulled the appreciation of many players to the importance of a good attack and release; yet it is as much a waste of time to try to play Bach's D Major Fugue with slow pneumatic action as it is to try to play it in St.Paul's Cathedral or any other over-resonant building. On such actions, effective phrasing is very difficult or even impossible, and variations of touch and accentuation are quite lost.

"Many attempts have been made to increase the power of the old Diapasons, but almost always with disastrous results. The thin pipe-metal of which they are constructed cannot stand the more vigorous vibrations set up, and an unmusical tone generally results. Where the or-
1) iginal manual compass was to GGG, the GGG pipe has often been cut down

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1. The authors are, of course, mistaken in writing GGG; they are referring to GG (10 2/3ft pitch—the G next below 8ft CC). The use of three letters begins with the next note below this GG, i.e. FFF.

to CC, so that the scaling is radically altered. One must, therefore, beware of these possible contingencies when listening to what is ostensibly a typical early Diapason. Once encountered, the unforced singing tone of an untouched example can always be distinguished from a stop which has been doctored. The Diapason chorus by Green, on the Great Organ of St.Thomas' Church, Salisbury, is a very fine untouched example.

"Gottfried Silbermann was the first transitional builder between the old and the new; working in the middle of the eighteenth century, he produced a formalised style of instrument, conforming to the rigidly classical taste of the day. His Diapason voicing was markedly bolder than anything earlier, and he used pressures up to 3¼ inches for the Hauptwerk, or Great organ, and as much as 4 inches on the Pedals. About a century later his pioneer work was developed almost to finality by another German, Edmund Schulze, though the most characteristic work of the latter was done solely for England.

"Schulze did everything to get the maximum power from moderate wind pressures, and most of his Great organ Diapason choruses are on 3¼ or 3½ inch wind. As the scaling he employed was little larger than that of the early builders, the tone of his Diapason was naturally a good deal more brilliant. Increased power was obtained by the use of enormous footholes and a wide mouth. He prevented the tone from becoming strident by the use of adequately heavy pipe-metal of fine quality. The tone of a Schulze Diapason is very striking, and his methods were successfully adopted by T.C.Lewis. Schulze did not always employ a powerful unison, and his fully-developed type is only to be found at Tyne Dock and Leeds Parish Church."

It seemed almost as if Schulze's influence had made itself felt instantaneously, when our old friend the York Minster organ was re-born in 1863 under the aegis of Dr.Monk and William Hill, for its 24-stop Great had many points of resemblance with that of Doncaster, both general and particular. (An interesting lesson in the difference between a well-planned design and a haphazard hotch-potch may be learned by a comparative study of the final Camidge specification and the Hill-Monk rebuild as set out at the end of this chapter.)

While these various "giants" were being constructed one by one, it is refreshing to find also a steadily rising standard of sound planning among the smaller instruments. Willis, Walker and Hill were scrupulous in their determination to achieve a satisfactorily complete flue-chorus even on a Great of only ten stops or less; and Schulze produced a little masterpiece at St.Mary's, Tyne Dock (South Shields) in 1864 — double, three unisons, principal, twelfth-fifteenth combined, four-rank mixture and unison reed — a total of eight stops. Gray and Davison at Cirencester (1866) also had a splendidly compact seven-stop flue-chorus from double to four-rank mixture. It is curious to observe that the old "Middle-C Cornet" still appears, with what exact purpose it is difficult to imagine, unless it was intended for amplifying the trebles of the chorus reeds in the days before harmonic trebles and higher-wind-pressures had become universal and standardised. Park Church, Glasgow (Hamilton, 1866) had a five-rank example; and there was one of four ranks at Bury St. Edmunds Cathedral (Walker, 1864).

Another builder who showed himself to be well abreast of contemporary thought was Robson, in his organ at St. Peter Port, Guernsey, in 1866. His ten-stop flue-chorus (double to four-rank mixture) had, as its unisons, an open diapason, German gamba, clarinet flute and dulciana; and there was a clarinet as well as a unison chorus-reed. (The prevalence of clarinets on the Great of well-planned two-manuals has been referred to already.)

The survival of the Cornet is one of the oddities of the period; another inexplicable "echo of the past" appears in the large and spaciously-designed Walker rebuild at Queen's College, Oxford — which, like its neighbour further down the High, Magdalen, has suffered the unusual experience of being steadily reduced in size through successive rebuilds. Queen's, in 1866, found itself newly provided with a Tenoroon Diapason and a Tenoroon trumpet on a 64-stop instrument; in the name of logic and reason, why ? The pedal department of ten stops was quite adequate; but perhaps the responsibility lies with that eccentric figure, the Rev. Dr. L.G. Hayne, whose theories and experiments were numerous and diverse but who has left little impression on the history of the organ except for a number of amusing anecdotes (for instance, the most likely reason for the decrease in size of the organ at Queen's is the fact that Dr.Mayne is believed to have taken quite a considerable portion of it away with him when he left the college to take up a living elsewhere.)

Henry Willis celebrated the twenty-first anniversary of his Gloucester "stepping-stone to fame" by adding another to his growing list of large concert-organs: an 58-stop instrument at the Alexandra Palace, London (1868). The Great, of twenty stops, had a complete flute family from 16ft to 2ft, as well as an ample diapason chorus, with one solitary string representative in the 8ft viola da gamba. This organ, incidentally, was destroyed by fire not long after its opening, and a new organ was built immediately to exactly the same specification, stop for stop identical in all departments — a clear indication of Willis' satisfaction with the original design after having put it to practical test in the hall for which it was planned. The second instrument was opened in 1875.

Another Schulze masterpiece appeared in 1869; built originally for a private house near Leeds, it very soon found its way into the church of St.Bartholomew in the Armley district of that city. It was a four-manual with its fifty-six stops evenly distributed over the five departments — Great and Pedal had twelve each, Swell and Choir eleven each, and the fourth (Echo) manual had ten. This Great had the unusual number of three doubles — two flue and a reed — among its twelve stops; and there were four contrasting unisons. Where some other builders, in a Great of this moderate size, would have had but one flue double and a pair of reeds of 8ft and 4ft pitch, Schulze thought otherwise. Four years later, in a smaller organ at St.Peter's, Hindley, Lancashire (three manuals, thirty stops) he went further still in demonstrating the importance of a good sub-foundation when the upperwork was as brilliant as his, by including the same three doubles in a Great of only ten stops.

Meanwhile, in 1871 Henry Willis had finally established himself at the age of 51 (if, indeed, there had been any real doubt of the fact for the previous fifteen years or more) at the head of his
1) craft in Britain, when he erected the largest instrument of the nineteenth century in London's Royal Albert Hall. This giant of 107 stops was, of course, to a certain extent demanded by the great size of this celebrated — one almost writes notorious — building, with its seating capacity of close on ten thousand people; and it is interesting to compare its design with that of Willis' other large organs at St. George's Hall and the Alexandra Palace.

The Liverpool Great had the same number of stops as the Albert Hall, namely twenty-five; at the Palace, there were twenty. The first, and most striking point that emerges from the comparison is the disparity in flue doubles: Liverpool with one, the Palace with two and the Albert Hall with four. Liverpool coincided with the

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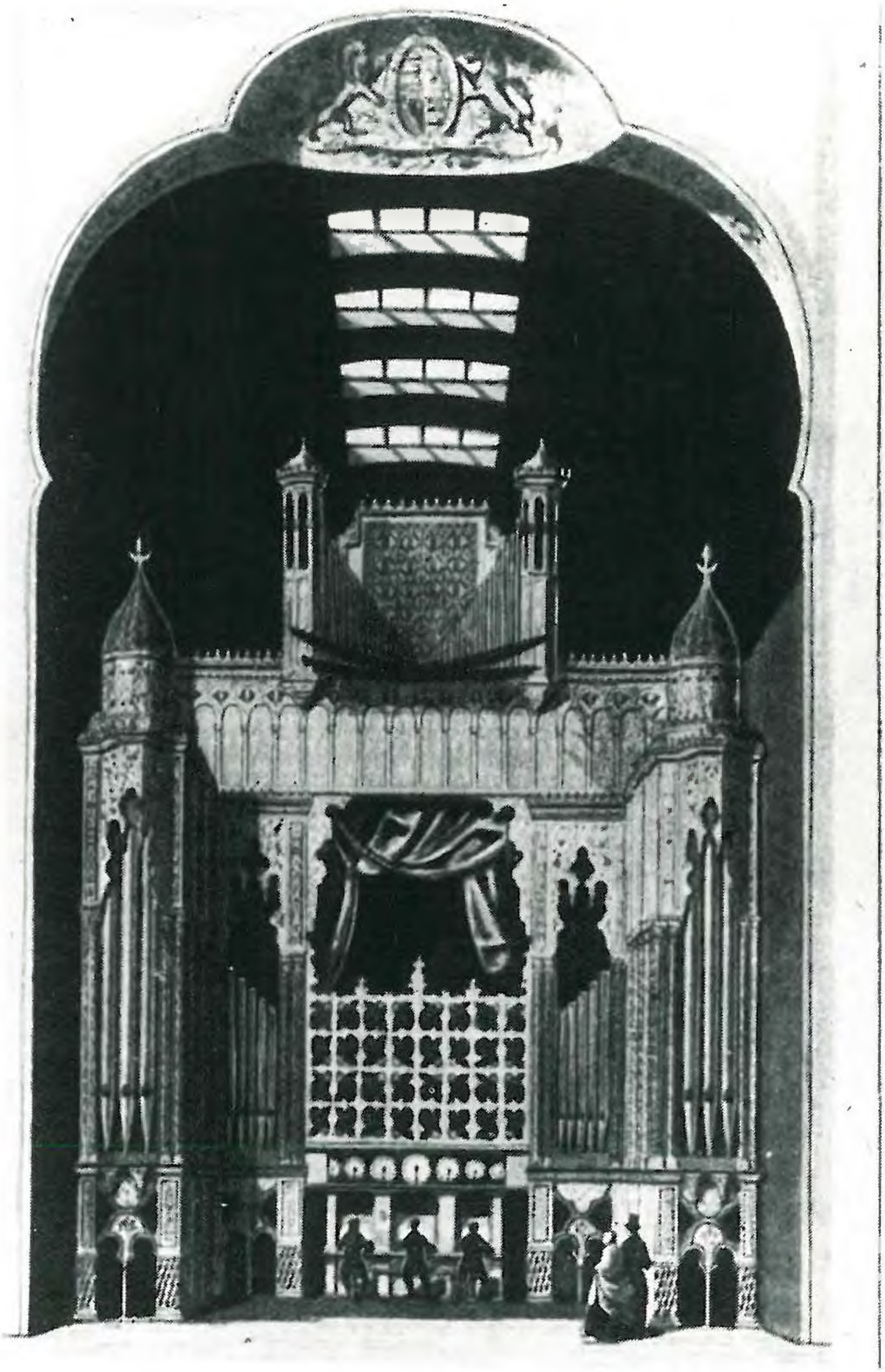
1. The largest, that is to say, of all organs in Britain; the British-built organ for Sydney (Australia) was larger still.



Albert Hall in the number of unisons, six; while the Palace proportionately had one fewer. But the Liverpool upperwork exceeded that of the Albert Hall slightly, to the extent of a 4ft, a tenth and a mixture-rank. Again, in the reed section there was similarity of numbers, though the Albert Hall had a pair of harmonic reeds at 8ft and 4ft pitch. Thus the last, and largest, of the three instruments showed a pronounced bias towards the sub-foundation and away from the upperwork. Admittedly, however, the great use of harmonic flutes and reeds at the Albert Hall, and the increased wind-pressures of the reeds, will have strengthened the harmonic development of the chorus; nevertheless, the sudden emphasis on 16ft tone is a remarkable step — rendered more curious by the absence of any real Double Open Diapason among the four of them.

The influences of French organ-building, like those of Germany, had cast their shadows before any of their instruments arrived in Britain; and Cavaillé-Coll (who can justly be considered the personification of French nineteenth-century organ-building) was known both by the harmonic flutes and reeds which had first appeared at St.Denis, and, less directly, through the so-called "Barker lever" action which he had encouraged and adopted where England had failed to do so. Now, during the seventies, he built several instruments for Britain, including some of first-class importance. His British début had actually been in 1866, in the French Carmelite Church, Kensington, where his 24-stop 2-manual contained an admirable 12-stop Great — flues from 16ft to six-rank mixture, reeds 16,8 and 4ft. (The Swell was less inspiring, but the Pedal was interesting enough for its size: two 16ft flues, and reeds of 16ft and 8ft.) However, it was after 1870 that his best-known British work appeared, and its undoubted influence on British design, both tonally and mechanically, merits a few words here.

As the result of an introduction by Manuel Garcia, the illustrious professor of singing at the Royal College of Music, Cavaillé-Coll was commissioned to build an organ in the country-house of Mr. J.T.Hopwood, a successful music-publisher, at Bracewell, near Skipton. This was opened by Dr.Spark and played upon by many eminent organists, so that the repute of its builder may be said to have had a "flying start". Then came a two-manual for Paisley Abbey in 1872, of almost identical size and design to the earlier Kensington organ. This was followed by a sterling handful of others, among which there stood out the large four-manual organ in the Albert Hall, Sheffield (1873) and the three-manual — later enlarged by its original builder — in the Manchester Town Hall (1877). It is significant that these two newly-prosperous communities in a part of England that is not traditionally very xenophile should have thought fit to go to France for their new municipal instruments; high testimony indeed for Cavaillé-Coll.

The Sheffield Great, of sixteen stops, had diapason, flute and string tone at 16ft subunison pitch, and a tonally well-varied build-up to nine mixture-ranks (a very loud 4-rank Cymbale for climaxes, and a less assertive 5-rank Fourniture). The chorus reeds, on the comparatively low pressure of six inches, were voiced loudly to the point of brassiness, but they certainly added brilliance to the ensemble. As a recent writer has pointed out, Cavaillé-Coll's reeds were a very different proposition in a non-resonant room ("reminiscent of the better type of 'fair organ'" is the phrase employed) from the effect they produced in a large French Gothic church. British builders were beginning to demonstrate that heavy pressures were of value, not solely to increase the amount of noise, but to improve and refine the actual tone and regulation of the pipes.

The Manchester organ, in its original state slightly smaller but of similar design, survived to form part of later rebuilds and is still to be heard; and another Cavaillé-Coll organ which has remained in almost its original state is the Bracewell instrument of 1870 which Hopwood transferred to Ketton Hall in Rutland and at the same time had it enlarged by its own builder. In 1926 it was purchased by the Warrington Corporation for the large Parr Hall in that town, where it was re-erected (and has since remained) in practically its 1875 condition.

At Sheffield, there is not such a happy ending to the tale; this British chef d'oeuvre of the greatest of French builders spent the later years of its life in dusty silence behind a cinema screen, from which its release by German air bombardment in the Second World

1. W.L.Sumner, in Org.34.82.

War must have been almost merciful. (One wonders what were the reasons — and they must have been very strong ones — which prevented the Sheffield City Corporation, when their new City Hall was built between the Wars, from transferring the old organ so short a distance across the road and incorporating it in the new instrument.)

Before this third quarter-century draws to a close and ushers in the Electric Age, a new name begins to be found more and more frequently on the consoles of recently-built organs; T.C.Lewis of Brixton, who devoted himself to spreading the gospel of Schulze — bright, bold, brilliant low-pressure flue-work of very complete harmonic development. St.Peter's, Eaton Square (1874) had an eighteen-stop Great which showed Lewis to be a worthy successor to the great German. An unusual feature was the presence of two string stops among the six unisons: and the proportion of unisons was slightly higher than at Doncaster, but the Schulze touch was there, without doubt. Lewis arranged his Great on three different soundboards: the front one had the more powerful flues from 16ft to five ranks, the middle had the reeds, and the back had the lighter flues from 16ft to the two lesser mixtures; moreover, the middle and back soundboards were under ventil control. This vitally-important idea of a secondary chorus is one whose possibilities were at least dimly realised, though but feebly grasped at, during our period; for to be fully effective, such a secondary chorus needs to be transferable to another manual so that its antiphonal value may be exploited to the full. The Leeds Town

Hall organ was a remarkably enlightened design in this respect, with its "front" and "back" Greats, the latter ventil-controlled and transferable to the Swell; but so little was the value of this device appreciated, even by one of its co-designers, Henry Smart, that when he and W.T.Best specified two independent Greats in the Lewis organ at St.Andrew's Hall, Glasgow a few years later, the secondary Great was allowed to lose more than half its usefulness by being confined to its original keyboard. It is sad to relate, in the trenchant words of George Dixon, that

1) "The wiseacres responsible for the subsequent reconstruction of these three instruments actually merged the independent Great organs into one unwieldy department. Thus the light which began to illuminate the organ world in 1875 seems to have been totally eclipsed."

The Eaton Square organ was particularly unfortunately treated in 1902 by the same firm — but not the same man — who had first planned it. The two string stops were removed, as well as the twelfth and the five-rank mixture; in place of these, a third open diapason, a family of loud harmonic flutes in 8,4 and 2ft pitches, and a further chorus reed were added. These new stops, together with the merging of the separate sections into one, did not quite destroy the original Lewis-Schulze brilliance; but obviously much of the "bloom" had gone.

The question of compass is no longer a matter of reporting the vanguard of the CC forces; what now remains is the "mopping-up" of the

1. Org.25.121

scattered rearguard of the defeated GG men. In fact, of all the organs newly built or rebuilt during the period of this chapter, only eleven per cent were of G compass, of which the final example was at Rochester Cathedral (Hill, 1875); the next chapter will, however, record one later still — Exeter Cathedral, by Speechley in 1876, which seems to be the last important rebuild in Britain where the old long compass was allowed to persist. St.George's Hall, Liverpool, has already been mentioned in this connection; on the insistence of S.S.Wesley, the new organ had to be built in 1855 with a GG manual compass — though Willis remained adamant at least for a CCC Pedal — and so it remained until its next major rebuild in the nineties. The extent to which Wesley was fighting for an already lost cause is illustrated by the fact that only six organs of any prominence were built with the G compass after 1855.

In fairness to Wesley — who, after all, was no fool in musical matters ! — and his fellow "G-men", it must be admitted that the alteration of compass was not always skilfully handled. The long compass had a certain merit in its provision of a suitable, self-contained bass down to the 10 2/3ft pitch (or 21 1/3 in the case of a double) for every stop in the department; but it happened far too often, when a change of compass from GG to CC was carried out, that this bottom half-octave was summarily excised, and replaced most inadequately by one or two highly unsuitable basses of the "big bum" and "little bumm" variety. W.T.Best's playing, in the use which he made of his long-compass manuals for more than forty years, was in itself a powerful argument for their retention (though it must be remembered that this argument was backed up by Willis' very complete CCC Pedal department). Thomas Casson, to whom as much as anyone is due the modern conception of the Pedal-organ, said in 1905, referring to this shortening of the manual compass:

1) "It was as if one lopped off the orchestra at the lowest note of the violoncello and substituted a big drum for double-basses and other deep tones. I have myself too keen a remembrance of the old long-manual organs not to grieve over the brutal rule-of-thumb which destroyed them without providing any substitutes. The evil method has been but slightly ameliorated. Mr.Best wrote to me in 1887: 'Unfortunately, when organ-builders shortened the keyboard compass in the region of the bass, they constantly neglected to supply the indispensable equivalent of an adequate pedal organ. Even in the largest instruments where an attempt is made in this direction, it will be at once remarked that the pedal-bass is suitable only for the Great or most powerful clavier, the varieties of delicate tone in the bass (to combine with the more frequently-used Choir or Swell claviers) being almost invariably absent.'

"It cannot be said that there has been any general im-

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1. Casson, "The Pedal Organ", pp 14 and 16-17.

provement in this matter since Mr.Best wrote.........The shortening of the manual compass completed the destruction of the old organs. Instead of regarding the alteration as a lengthening of the compass of the organ, the 'practical man', that is the rule-of-thumb English builder, regarded it as a shortening by at least half-an-octave, and threw the superb old basses between CC and GG into the melting-pot. Now these old organs should have been restored by completion; not by mutilation. The old basses should have been carried down to 16ft on the pedal and in 8ft on the manual, as done in Germany 350 years ago. I attach no blame to any particular builder; but one may especially deplore the disappearance of such historic features as the basses of Green's masterpiece at St.George's, Windsor, and those of Snetzler's Dulciana to GG at Lynn, and other fine instruments and stops.

"All these destructions and degradations are directly due to the ignoring of the true theory of the pedal organ. Most
1) English organs contain only one or two pedal stops; occasionally we find three, seldom four; so it is plain that the theory of the pedal-organ has not dawned upon the normal English builder. For instance, a well-known organist complained that he required a soft pedal stop as well as the solitary 'Open Diapason' provided. The builders' foreman, who greatly vaunted himself as an organist, and therefore well informed as to what was necessary,

1. Casson is painting an exaggeratedly gloomy picture here, but he is pleading a worthy cause, and so he must be forgiven if he overstates his arguments.

drew the Swell Bourdon alone and coupled it to the pedal, remarking, 'There's yer soft ped'l bass. What more d'ye want ?'

"Again, there was up to a few years ago an early CC organ by Hill, containing, for an English organ of its date, the wonderful pedal of Open Diapason, Bourdon, Trombone and Octave Coupler --- six pipes per pedal key. This was 'restored' a few years ago from the design of an eminent organist and by an eminent builder. It has now the usual 'commercial' bass, Open Diapason and Bourdon without the Octave Coupler, the pedal organ being 'restored' thus to two pipes per key instead of six. And that for an organ entitled to seven or eight at least !"

As regards the upward extent of the compass, the majority of CC keyboards in the fifties went up to F, 54 notes, following the trend which was becoming apparent before the mid-century. However, from about 1860 onwards, there was what election-reporters term a "landslide" in favour of CC-G, 56 notes. The other two CC compasses --- up to A (58 notes) and to C (61 notes or five octaves) --- were still comparatively infrequent. Over the whole quarter-century, in fact, the four different compasses were used in the following percentages of cases (referring to CC organs only):--

CC-G, 55%. CC-F, 26%. CC-A, 12%. CC-C, 6%.

In his 1862 rebuild of the organ in St.Paul's Cathedral, Henry Willis retained the GGG compass on the Great, which had survived from Father Smith's time; but that bottom octave was destined to last only a decade more.

<u>The Swell Organ</u>

Many of the Swell organs built in the third quarter-century showed that the role of this department was still imperfectly established — or, to put it another way, that, even if the ultimate ideal of the Swell ensemble was envisaged, the means of achieving it were not yet within the technical powers of every builder. (We are fortunately relieved from any dangerous speculation as to whether it has yet been achieved by every builder to-day, by the fact that the twentieth century lies outside the province of this work.)

Swells were still, in many cases, much smaller than the Great, sometimes seeming to belong to a previous century. Hexham Abbey, for instance (Nicholson of Newcastle, c.1860), had a five-stop Swell — 8,8,4,8,8ft — against a reasonably complete, though "double-less" Great of nine stops; and Willis himself, the "father of the Swell", installed at Newport Pagnell, Buckinghamshire, in 1865 an organ whose ten-stop Great, with its complete flue-chorus and chorus-reeds in 8ft and 4ft pitches, was matched by a Swell of six stops arranged 8,8,4, 2,8,8ft.

Two years later, Willis sinned again with a Swell (at St. Mary's, Holloway) which did not even have the merit of a 2ft stop, but had instead an extra unison; and here again the six stops of the Swell were in contrast to the well-developed Great of ten. There does, however, seem to be a noticeable levelling-up of Swell and

Great departments from about 1868 onwards; and henceforward the majority of Swells are either approximately the same size or only very slightly smaller. To be more precise still, among all the important new organs between 1868 and 1875, one-half of the Swells are equal to or larger than their Greats, and a further one-sixth are only one stop smaller — a total of two-thirds altogether.

The Exhibition organs, apart from the Willis leviathan which afterwards went to Winchester, had only one respectable Swell scheme to offer: that by Gerps had a perfectly-laid-out design of eleven stops. The general attitude of uncertainty is typified in three Cathedral organs dating from the Exhibition year — Ely and Chichester (by Hill) and Lincoln (by Allen). All three obviously represented a partial restoration of existing Swells, and so the two builders mentioned need not be loaded with all the responsibility; but these organs do demonstrate that, although theories and opinions were here and there beginning to take shape regarding the aim and object of Swell-design, nevertheless at this stage leading builders were not sufficiently convinced or confident to make wholesale alterations in the course of rebuilding an historic instrument.

Hill's Doncaster organ, however, was another welcome stride forward (1852), with a nine-stop flue-chorus and six reeds on its Swell. The flue-work had a marked preponderance of higher-pitched stops; and here, as in most of the other large Swells of the period, the aim seemed to be to reproduce the Great fluework, but on a lighter scale and with less unison stops in proportion to the mutations and mixtures; there was little, if any, provision for soft registers of different tone quality at first, apart from the inevitable Stopped diapason. String and celeste tone was something that had to work its way into the scheme gradually: but by the seventies it had come to stay. At Christ Church, Spitalfields, for example (Gray and Davison 1852), the thirteen-stop Swell had the uncommon feature of two flue doubles, as well as a complete reed chorus, but its specification up to mixtures could have been bodily transferred to the Great without raising any eyebrows.

A more intelligent-looking design was that of Glasgow City Hall (also Gray and Davison, a year later), where a new tinge was imparted to the flues by the Keraulophon and the Clarinet flute; and there was also the Vox humana, a stop which has always been the subject of much argument and even more prejudice. It is true that a lot of this prejudice may be a natural reaction against the sentimental effusions which have always surrounded it, and in more recent times against the excessively alcoholic goat-bleat of the cinema-organ version of the stop -- mass-produced, badly-voiced and used with the wrong type of perpetual tremulant. None the less, a well-voiced Vox humana, though of no chorus-value whatever, can be effectively used for certain types of solo, alone or in combination.

Wedgwood's very objective account of this stop reminds us that:

1) "......the effect of the Vox humana is almost entirely dependent upon the acoustical properties of the building in which it is situated. No amount of care expended in the voicing will render the Vox humana, located in a non-resonant edifice, aught but a ludicrous caricature of the human voice. Used with the tremulant, in a very large or reverberant building, it may, by reason of its peculiar 'nervous' fluttering effect, and by force of contrast with other stops, be caused to simulate a human singer, especially in the tenor portions of the compass; and still more in chords may it suggest the idea of a choir singing at a distance.......

"However much cynics may protest that the Vox humana was never found to bear the faintest resemblance to the human voice, it is a well-authenticated fact that the uninitiated are constantly deceived into believing that they are listening to distant voices. In fact, the author distinctly remembers that when, as a boy, he heard the Albert Hall organ for the first time, he asked why 'the man sang from the back of the organ?' Many of the organs in large Continental Cathedrals, in themselves of very indifferent voicing, nevertheless appear to be of magnificent tone by reason of the favourable acoustical conditions under which they speak. Sound, indeed, is always enhanced by reflection."

A little later, Wedgwood continues: "It is quite a fallacy

1. Wedgwood, op.cit., pp.179-80.

that the Vox humana so constantly finds a place in the organ merely on account of its possible likeness to the human voice. On the contrary, it forms a timbre-creating stop of no inconsiderable value. It is available as an effective accompanimental background to stops of various kinds, and combines well with flute stops. Needless to add that, in view of this, the practice of permanently connecting a Tremulant to the Vox humana is not a desirable one to be adopted as a precedent. Should an organ be of sufficient dimensions to include a Solo department equipped with enclosed flutes, the Vox humana will probably be found more serviceable on this manual than in its more customary position in the Swell organ."

A gamba makes its appearance on the Swell of the Willis two-manual (and two very well planned manuals they are !) at Cranbrook, Kent in 1854; and it is interesting to notice here that Willis has a double reed, but no clarion. At the present day, it goes without saying that if a choice has to be made between one or the other, the double must be included — ceteris paribus, of course. Willis was not always consistent in this respect, as subsequent examples will show. Holdich came to the correct conclusion at Henley in 1854, where his twelve-stop Swell had no less than three doubles, with a viola da gamba among its unison flues. St.Martin-in-the-Fields (Bevington 1854) had the welcome additional quiet effect of the dulciana; similarly useful were the salicional and lieblich gedackt at King's College, Strand (Willis 1854), where the Swell double was a contra gamba.

From this organ, it is rather a large step to the hundred stops of the St.George's Hall organ at Liverpool, by the same Henry Willis in the following year. In this instrument we can examine the builder's procedure when unfettered by any considerations of cost or of having to re-use existing pipework. Willis and S.S.Wesley must have been offered "carte blanche" tonally, and the result was a Swell of twenty-five stops (the same number as the Great) and a splendid design.

The proportion of reed stops is the first point of interest that strikes the eye -- ten stops out of the twenty-five, just over one-third. This figure might almost be taken as a rule-of-thumb for Swell-design (assuming a certain amount of discrimination in the choice of reeds, naturally !) Six reeds in a fifteen-stop Swell, for example: rather more than one would generally find in a modern scheme. But, to go further still, how often even to-day would one expect to find four reeds (oboe 8ft and chorus-reeds 16,8 and 4ft) in a ten-stop Swell; or two reeds in a Swell of only five stops ? The temptation is very strong, at this juncture, to set down and discuss suggested designs for a five-stop Swell (and what a little gem could be produced by the right builder, Messrs. Erewhon Ltd., of Utopia, to such a plan as 8,4,III,16 and 8ft.)

At any rate, it has now come to be accepted, almost -- but not quite ! -- beyond dispute, that the Swell must be built up round the chorus-reeds and mixtures. Even in the smallest instruments, this principle should apply; and it is here that some designers, who are faithful to it in a large Swell, begin to have illogical qualms. Admittedly it may be said in their defence that, in a small two-manual, the Swell has to fulfil the role of Choir-organ also at times, and therefore needs a selection of quiet flues more urgently than its reed-chorus. Possibly so: but how much more effective is the light, sparkling accompaniment provided by the three flue stops in the plan suggested a few lines back, than the negative, neutral, unisondus tones of the possible alternatives that would be offered — 8,8,8,4,8ft in all likelihood, with the solitary reed almost certainly being an oboe ! It is a choice between a glitter glowing into a blaze on the one hand, and a secondrate brand of damp squib on the other.

All this, perhaps, may seem very far from St.George's Hall in the year of grace 1855; but in fact the connecting thread is a strong and tangible one. Willis was now beginning to bring to fruition his ideas on the tonal design of the Swell; and it was in his great concert and cathedral organs that he was able to prove his theories and demonstrate his ideals. For it was high time for something to be done to improve the general effect of the average Swell. Considerably though this department had progressed during the first half of the century, its tonal result as an ensemble left much to be desired in the way of blend and characteristic colour.

PLATE VIII.

The Royal Panopticon of Science and Art,
Leicester Square, London.

This remarkable instrument was built by Hill in 1853, and temporarily installed in the south transept of St. Paul's Cathedral between 1860 and 1873. This reproduction of a contemporary illustration in a London periodical shows clearly the "console in triplicate" described on pages 259 and 260. The clock-like objects over the players' heads are a set of drums.

(Reproduced from "The Cinema Organ", by Reginald Foort, page 73.)

In many organs — the majority, in fact — it was little more than an enclosed miniature Great; but, for all its faults, it did not deserve the rather over-simplified condemnation expressed by one recent writer:

1) "Having shut the small chorus in a box, English builders found it sounded rather anaemic, so they gave the reeds rather more prominence than on the Great. Having done that, they found it sounded rather thin and sizzly; so they added a bourdon for the necessary ballast. And there we have the typical Victorian swell, all quite logical and tidy."

The phrase "typical Victorian swell" is not a well-chosen one, implying as it does that Swell-design remained static for sixty-four years. From the context it would appear that "early Victorian" or "mid-century" Swell is meant, for it is an organ of that date which is under discussion in the article from which the quotation is taken (Romsey Abbey, which though rebuilt in 1888, presents most of the features of its original form dating from the fifties). Moreover, the writer goes on to point the contrast of the "reed-chorus swell", which, he says,

"is really quite a different conception altogether. It depended on the ability of the Schulze diapason chorus, on the one hand, to stand by itself; and on the ability of the Willis reeds, on the other, to exist without flue support. Ironically enough,

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1. Cecil Clutton, in Org.19.174.

neither man realised the fact, which was first exploited by T.C. Lewis. I do not think there is the smallest indication that Father Willis realised the significance of his still unsurpassed reeds in this connection, nor of the absolute dependance of the modern full Swell upon a powerful 16ft trumpet. His usual 16ft contra oboe, beautiful as it is, is of little use in the full Swell, and he rarely introduced a contra posaune until there was
1) a double trumpet on the Great. (St.Bees, however, is one of the few exceptions.) When there is a contra posaune, we certainly have the finest of full Swells; but I do not think the evidence shows that Father Willis looked at it in this light. I doubt if he regarded it as more than a perfected example of the old miniature Great, which in fact, with his type of Great organ, it undoubtedly was."

The "usual 16ft contra oboe" or equally often "contra fagotto" was not by any means as valueless as this quotation would have us believe; it would be truer to say that it was less effective than the posaune-trumpet type of double, but inestimably more useful in the ensemble than any flue double or 4ft reed would have been in its absence.

A further comment on the Swell of this period may be quoted here, from the pen of another and greater authority, written actually as a follow-up to the previous passage:

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1. The St.Bees Priory organ was built by Willis in 1899, and will be referred to frequently in Chapter Four.

1) "The ordinary mid-Victorian swell, however logical and tidy it may have been, was largely ineffective because, like Romsey, it was a miniature Great enclosed in a box." (The dates of Romsey's building and rebuilding were respectively <u>early</u> and <u>late</u> Victorian, and were not within ten years of being "mid-Victorian").

"It would have been better to utilise it, minus the reeds, as an unenclosed choir. As such, it would have been much more useful. Its light-pressure reeds were generally harsh and strident, with rasping basses and woefully weak trebles. In addition, their ill-assorted overtones clashed with the crude mixture-work then in vogue, and produced the sizzling effect, facetiously termed

2) 'sausage-frying', particularly if the clarion were present....... To make up for this......the bourdon was introduced; but as it was often too big in the tenor and bass, it produced a muddy effect. Willis' early Swells of this type were comparatively free from these defects, because his reeds and mixtures were more musical in tone, and his bourdons kept down in the lower part of the compass. He sometimes used, with better effect, a small diapason, salicional or contra gamba, with stopped basses, except in his largest organs."

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1. George Dixon, in Org.20.174.

2. The term "sausage-frying" for badly-voiced, low-pressure reeds is well-known, but obscure in origin. Hopkins relates that it was coined by Massey of the Chapel Royal to describe the Swell reeds at Westminster Abbey, as used by Turle in the 150th Psalm, somewhere about the mid-century, according to a correspondent in Org.25.142. Spark, however ("Reminiscences",p.249) attributes the phrase to Smart's opinion of the reeds in a new Leeds organ.

There can have been little "sausage-frying" at St.George's Hall, even though the Swell reeds were on the not-at-all-heavy pressure (for so large a building) of six inches. Flue variety there was in plenty, and wasteful duplication of tone-colours was non-existent — the two open diapasons, the two fifteenths, the two clarions, were each quite separate and distinct; and the diverse possibilities of full-swell effects were countless.

This organ was an undoubted turning-point in Swell design; and from now onwards, the Swell in an increasing proportion of instances was provided with a complete reed-chorus as its keystone, holding together in a cohesive unity the light, varied, harmonically-balanced flue chorus which led up to it. This, be it stressed, included much smaller instruments than St.George's Hall. It might be affirmed, to put it bluntly, that any fool could build a decent Swell with twenty-five stops. Willis, however, answered this unspoken — and quite unfounded — theory before it had time to occur to his rivals and critics; his answer was given at Carlisle Cathedral in 1856, where, in conjunction with W.T.Best, he produced an eleven-stop Swell with five reeds (16ft to 4ft) and six flues (16ft to five ranks). A year later, at Wells Cathedral, he repeated this scheme, without the Vox humana and with two ranks less in the mixture. His Swell of twelve stops at Clevedon Hall, Somerset (1858) again had a four-reed chorus; and there was greater flexibility in the flue section by the inclusion of a salicional and Voix celeste, which had to be excluded from the more "streamlined" Swells at Carlisle and Wells. Best and Willis collaborated once more in 1861, in the design of a very remarkable two-manual in Wallasey Parish Church, where Best was at that time organist. Most of the ordinary organists and organ-committees (and how very ordinary they reveal themselves to be !) who are called upon to plan a medium-to-small instrument, think more of the splendid appearance of a third manual on their consoles, and proceed to dissipate their stops among three emasculated manual departments. Neither Best nor Willis were ordinary men, as we know; and at Wallasey the twenty-six stops were used to form properly-equipped Great, Swell and Pedal organs. The relative priority of flue and reed in the Swell was made quite clear by the inclusion of a reed double, but no flue double; and there were four reeds in the nine-stop Swell.

The Manchester builders, Kirtland and Jardine, in their two notable local instruments at St.Peter's and the Free Trade Hall (1856 and 1857) followed the Willis plan (five reeds to nine flues, and six to thirteen respectively), and included a 2ft octave clarion in the latter Swell. Gray and Davison also adopted the same doctrine in their two great contemporary instruments at the Crystal Palace and Leeds Town Hall (1857 and 1858); but in this connection it must be borne in mind that however faithfully other firms may have reproduced the tonal schemes of Henry Willis, the tonal effect could not be imitated without the skill of Willis and his brother in the voicing of high-pressure reeds. One leading organist at least -- William Spark, who was

decidedly an admirer of Gray and Davison — referred to the Crystal Palace organ in critical terms: he wrote of "the rasping tones of
1) this not very sweet specimen of the 'King of Instruments'".

Nevertheless, the fact that not all Swells were as successful as Willis' did not prevent the design from hardening into a firm and clear-cut shape. Even an unknown builder, such as John Squire, was able to build an organ (at Craven Chapel, W.1, in 1857) with an eight-stop Swell arranged thus: 8,8,4,III,16,8,8,4ft. Holdich was establishing an excellent reputation for himself with such work as St.Margaret's, Westminster (1859) and Lichfield Cathedral (1860), in both of which the Swell was tonally progressive and thoroughgoing, but marred by minor old-fashioned features in the shape of divided and short-compass stops. Lichfield, for instance, had three stops divided at Tenor C, after the tenoroon fashion, and three stopping short at the same note.

Despite all these encouraging signs of progress, historical accuracy makes it necessary to point out that the annals of organ-building in the sixties and seventies were still pungent with the aroma of frying sausages; not even Willis was guiltless of this culinary blemish, which arose from the two main causes of bad reed-voicing, and faulty balance between reeds and flues due to incompleteness of the reed-chorus or to lightness of wind-pressure in this section of the Swell. A few statistics will help to summarise the position in

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1. Spark, "Reminiscences", p.42

brief. Of the organs dating from this period (i.e. new or reconstructed), exactly 34% had a Swell which was complete in both flue and reed choruses; 30% were complete as to flues, but without a double reed; while the remaining 36% were complete in neither category. This last group may definitely considered to have fallen under the shadow of the frying-pan, for, as we have seen, at least a double reed _must_ be there if the Swell is to be the true, thrilling entity that Willis made it.

It may seem to be invidious to select examples from among these; but among two in high places and by leading builders, a black mark must be awarded to Vowles for his Bristol Cathedral Swell in 1861, which on top of the eight-stop flue chorus had three unison reeds only; and Willis should have known better, in 1862, than to do the same thing at St.Paul's Cathedral in his first rebuild there.

To return to the brighter side of the picture, Hill's rebuild at York in 1863 contained a Swell of eight flues and six reeds; and in 1864 Willis gave a foretaste at St.Patrick's, Hove, of what was to be his "Swell of Swells" at St.Paul's Cathedral eight years later — eight flues, with a contra gamba as the double, and including a salicional and lieblich gedackt, and four reeds. In fact, Willis found that this design at St.Patrick's was so successful in every way that it became almost a standard Willis plan, and was known as the "Brighton model".

In 1868, Willis' ill-fated Alexandra Palace organ (which he himself regarded as his next best instrument after St.George's Hall) maintained the now accepted balance of Swell chorus-work: seven reeds out of a twenty-one-stop total. Both flues and reeds had two doubles each; and there was a rather large amount of flute tone. Lewis' Swell at St.Mary's Catholic Cathedral, Newcastle (1869) reveals a fresh mind at work in its flue-stops; gone is the almost inevitable open-diapason-stopped-diapason combination; instead, the unisons are Geigen principal, Lieblich gedackt, Viola da gamba and Voix celestes — and the seven flues are followed-up by five reeds.

The Royal Albert Hall (1871) had a design which should have left nothing to be desired: twenty-five Swell stops, including nine reeds — three of them doubles — and with a much more varied look about the fluework than was the case at Alexandra Palace. Yet the effect in the building was disappointing, owing perhaps to the position in which it was situated and to the general peculiarities of the Hall's acoustics.

We have seen something of W.T.Best's previous record as an organ-designer, and his views have always seemed clear-cut and progressive; so that his scheme for Bolton Town Hall (Gray and Davison, 1874) is all the more disappointing in one of its major features. The fourteen-stop Swell, which he places as the uppermost of the four keyboards, has five reeds — but there is no double among them, and only two of the five are real chorus-reeds. The other three are the usual

Swell oboe, and two stops which could more profitably have been assigned to the Solo: Vox humana and Corno di bassetto. Perhaps Best was not able to impress his views upon Gray and Davison so successfully as upon Henry Willis.

Lewis' two well-known 1874 organs (St.John's, Wilton Road, Victoria, and St.Peter's, Eaton Square) again showed their builder's individual views in the flue-chorus, with his Geigens and his Violas da Gamba, and his Aeolian (a soft Echo Gamba) at St.John's; but despite his obvious devotion to the fluework of his instruments, Lewis did not neglect to complete his Swell reed-chorus in a reasonably satisfying fashion. Indeed, in this respect he improved considerably on the work of his guiding-star Edmund Schulze, whose reeds in general had not been remarkably successful; nor, of course, had they been very unsuccessful -- they had simply been eclipsed by his flues. Lewis' reeds could not bear comparison with those of the Willis brothers; but at least they were far from being utterly negligible quantities in the tonal ensemble.

As far as compass was concerned, here again -- as with the Great -- the CC compass has so completely won the day that what remains is merely to chronicle the survivors of the opposition. Five different compasses were still found, apart from the CC; and the latter is used in over eighty per cent of the Swells dating from the third quarter-century. Taking the others in order of their disappearance: the FF (6ft) compass occurred for the last time at St.

George's Chapel, Windsor (Gray and Davison, 1855); and in the same year came the ultimate example of the long-compass GGG (10 2/3ft) Swell at St.George's Hall, Liverpool, and at St.Sepulchre's, Holborn (Gray and Davison). The Middle G Swell (2 2/3ft) made its last appearance four years later at St.Margaret's, Westminster (Holdich, 1859); and the Gamut G Swell did so in 1861, when Bristol Cathedral organ was rebuilt with this compass by Vowles.

The more popular Tenor C compass persisted sporadically throughout the period of this chapter, and was in fact used for about ten per cent of the Swells in organs of importance, including three Cathedrals and some collegiate and parish churches. The last prominent example of this compass is to be found in the final quarter of the century — the Church of All Hallows, Barking (Gray and Davison, 1880).

The Choir Organ

In some ways there is a slight improvement in the design of this department during the third quarter-century. The average Choir remains an unenclosed group of seven or eight stops on the plan 8,8, 8,4,4,2,8ft, and the reed continues to be the traditional clarinet (or the same stop under one of its various aliases), the most unsuitable of reeds for unenclosed use. But there is an appreciable tendency towards shaping the fluework into something approaching a true chorus. Between 1851 and 1875, no less than 25% of Choir departments had a flue double, and 10% had a mixture — a minority, it is true, but a by no means contemptible one; and certainly representing a brighter state of affairs than that described on pages 83 and 84. (The comparative percentages for that period were about six, in both categories.)

However, it was still not abundantly clear to what extent, if at all, organ-builders had a definite policy in their Choir design. The increasing tendency to develop a more complete chorus may be interpreted as a move in the direction of the "miniature Great" or "lesser chorus" — the "ruckpositiv" or "oberwerk" of classic practice. Yet there is another school of thought which holds that Willis and his followers intended the Swell to be considered in the light of a lesser chorus; and that the provision of a somewhat more ready ensemble was rendered necessary in order to "get the sound out of the box". Furthermore, it followed from this hypothesis that no chorus-ensemble was required in the Choir organs of the period; but yet it does not seem well-proven that, because the Swell and not the Choir is to be the chosen vehicle for the lesser chorus, the existence of an aimless and harmonically incomplete collection of registers is ipso facto justified on the Choir.

The real truth of the matter may be found to lie midway between these two viewpoints. As was mentioned on page 195, builders seemed, in the fifties, to be aiming at the creation of a "lighter Great" in their Swell fluework; but in the sixties a transformation was in proness of leading the Swell away from this objective, at exactly the same period of time that the extension of the Choir's flue-chorus was becoming more general. A gradual but noticeable change of pattern was being worked out simultaneously in both sections of the organ; and it is difficult to avoid deducing a connection.

Although it is among the moderate-sized Choir organs that one can find the surest evidence of what the builders considered to be the primary essentials in their design, it is of interest to compare first of all the four largest Choir departments of this period: St.George's Hall (1855) with eighteen stops, Leeds Town Hall (1858) with sixteen, Alexandra Palace (1868) with seventeen and the Royal Albert Hall (1871) with sixteen — all by Willis, except for Leeds, which was by Gray and Davison.

The St.George's Hall fluework was predominantly flute, with a touch of string and diapason; there were 8ft and 4ft chorus-reeds besides two imitative solo reeds. Three years later, at Leeds, the fluework was basically similar, though with a Dulciana double instead of a Bourdon, but the reeds here consisted of a light 16-8-4ft chorus, including a Euphone as a double — a free-reed (as distinct from the normal type of beating-reed used in organs)— whose quality was gentle and bassoon-like. The Clarinet and all its quasi-solo crew were now in their proper places on the fourth manual.

Ten years later still, at Alexandra Palace, we find that the passage of time has brought about a marked change in the aspect of Willis flue stops: strings and flutes now divide the field equally between them; but the reeds are as at Liverpool — chorus 8ft and 4ft, with two orchestral reeds. Finally, Willis changes his tactics again at the Albert Hall. There is about the same amount of string tone as at the Palace; less flute; and an allowance of diapason tone where there was none before. Moreover there is a greater proportion of higher-pitched flues at the Albert Hall (four 4ft and three 2ft to five unisons, as against four 4ft and one 2ft to six unisons at the Palace). The Albert Hall reeds are of the solo type, at 16ft and 8ft pitches, and there are no chorus-reeds.

Willis' original specification indicates seven of the Choir stops as being "intended to represent what is called the Echo organ in some large organs, and is then placed on a fifth clavier"; but as there was no separate means of controlling these stops (except presumably by one or more of the eight pistons allotted to each manual), there does not seem to have been a great deal of point in Willis' thus drawing attention to them.

These four great instruments were all Concert-organs; and the statement has been put forward that

1) "while 16ft flue stops appeared in the Choirs of many Cathedral organs, it was in concert instruments that mixtures and chorus reeds were to be found. Separate mutations were inserted only in

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1. Clutton and Dixon, op.cit., pp.94-5.

comparatively recent years." (This was published in 1950).

Now this is somewhat misleading; in actual fact, the honours were almost exactly even between Church and Concert-hall in the possession of fully-developed flue ensembles. Examples are given below in tabular form, as the brief and all-too-superficial generalisations which many writers have been prone to make about the "Victorian Choir organ" seem to be based on insufficiently detailed examination of the instruments about which they profess to speak. Here, then, are some instances of well-planned Choir organs during the third quarter of the century:-

1852	Holy Trinity, Manchester (Kirtland and Jardine) 9 flues(16ft to 2ft,with 12th) and Clarinet 8ft
1854	St.Martin-in-the-Fields (Bevington) 8 flues(16ft to 3 ranks) & Bassoon 16ft, Clarinet 8ft
1856	St.Peter, Manchester (Kirtland & Jardine) 11 flues(16ft to 4 ranks), Euphone 16ft,Trumpet & Voxhum.8ft
1858	Brompton Oratory (Bishop & Starr) 12 flues (16ft to 3 ranks), Bassoon & Cremona 8ft.
1862	Temple Church (Robson with Schulze) 10 flues(16ft to 3 ranks) & Corno di bassetto 8ft
1863	York Minster (Hill) 8 flues (16ft to 2 ranks) and Clarinet 8ft
1869	St.Bartholemew, Armley (Schulze) 10 flues (16ft to 5 ranks) and Clarinet 8ft
1874	St.Peter, Eaton Square (Lewis) 10 flues(16ft to 3 ranks),Orch.oboe & Clarinet 8ft.

In this list of eight organs, it will be seen that seven different builders are represented, but not Willis, who employed the complete flue-chorus only in his very largest instruments in concert-halls; in his medium-sized Choirs he had, for example, a double but no mixture at Wells (1857) and St.Paul's Cathedral (1872), and mixture but no double at Winchester (1854) and Newark Parish Church (1866).

To turn from the flues to the reeds, it is hard to explain how so many builders, who were in most other respects beginning to grasp at the possibilities of the Choir's true function, were nevertheless unable to shake themselves free of the fatal fascination of the universal Clarinet (or Cremona-Bassoon-Krumhorn-Corno-di-bassetto). An imitative type of stop, such as this, loses most of its potential effect in an unenclosed position; and although there can conceivably be some justification for it in a three-manual or on the Great of a two-manual, there is no shred of excuse for it anywhere on a four-manual except in its rightful place among the Solo stops, especially where the Solo is enclosed. Yet there were as many as fifteen four-manual instruments built in this period with their Clarinets on the Choir and not on the Solo; and ten others in which the Clarinet in one of its guises appears on both manuals; while in only four cases is the Clarinet divorced completely from the Choir.

Two of these four have already been referred to in recent paragraphs: Leeds Town Hall and St.Peter's, Manchester, with chorus trumpets on the Choir. The other two also deserve mention: Queen's College, Oxford (Walker 1866) had a reedless Choir of eight flues — 8ft to 2 ranks; and Bolton Town Hall (Gray and Davison 1874, to the design of W.T.Best). The latter organ has often been quoted in various thumb-nail sketches of the Choir-organ, in such a way as to give the impression that it was practically the only complete Choir in the nineteenth century. (Readers of these pages will, it is hoped, know better by this time). However, Bolton must be given the credit for the economy of its complete scheme of eight stops, for the beauty of its five-rank Echo dulciana cornet, and for its emancipation from the Clarinet; its solitary reed is a chorus one — a rather unsatisfactory trumpet, by all accounts. Among other choirs equipped with chorus reeds were: Christ Church, Spitalfields (Gray and Davison, 1852), the Panopticon of Science and Art (Hill 1854), St.George's Hall, the Crystal Palace and Alexandra Palace, the last-named having harmonic reeds in 8ft and 4ft pitch.

Enough has been said now to show that the Choir organ of this period was not quite so black as it is often painted. The "amorphous" type was still produced in large numbers — but then, so it is in the nineteen-fifties ! Perhaps our own descendants will write scathingly of the Elizabethan Choir organ, as they sit listening to a radio-controlled electro-neurotic organ being guided through some psychoanalysed fantasia in the key of E-and-three-quarters. However, there was a definite improvement for those that had eyes to see and ears to hear; and the new trend gave every reason for future optimism — whose justification or otherwise will in due course be unfolded in Chapter Four.

A recent little book, from which quotation has previously been made, contains two statements on the Choir organ which give the reader an impression that is not quite accurate, and which require a little critical examination at this point. Referring to the special need for a complete Choir of the "miniature Great" pattern in places where Cathedral music is performed, the authors write:

1) "It is......not a little remarkable that, until this century, no serious attempt was made to develop the Choir to its logical conclusion, in its natural ecclesiastical home. In most cases, we find it topped by a Piccolo and Clarinet. There was, however, one important exception: the Choir organ by T.C.Lewis at Southwark in 1897, which comprised a three-rank mixture (15,19,22). It was the only Cathedral organ for many years which contained a compound stop on the Choir. The double was a Lieblich Bordun. Like his magnificent flue-work Great organ, the Lewis Choir fell on deaf ears, and it was not until some ten years later that the real development began.

"About this time, another change took place. Under the influence of Audsley, the apostle of enclosure, Choirs were placed in Swell-boxes. Cavaillé-Coll had enclosed a few of his Positifs, and sporadic attempts had been made in this country. The first English Choir, including a double, to be completely enclosed, was that in the well-known organ at St.Margaret's, Westminster in 1896........."

The "one important exception", as we have now seen, was neither so solitary or so belated as the authors would have us believe.

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1. Clutton and Dixon, op.cit., pp.95-6.

Moreover, at least three Cathedral organs, in this period (1851-1875) alone, have compound stops on the Choir, to wit: Winchester (1854), York (1863) and Worcester (1874), not to mention the Temple Church (1862), which has always been regarded as an "honorary Cathedral", musically speaking. If, instead of writing "the only Cathedral for many years" the authors had written "the first Cathedral after the lapse of a number of years", they would have been much less ambiguous and correspondingly more accurate, for between Worcester and Southwark there was only Beverley Minster (1885 -- another "honorary Cathedral") which had a Choir mixture. But there is no gainsaying the fact that the impression given in the passage quoted is that Southwark was first in the field: which is historically untrue.

As regards enclosure, St.Peter's, Eaton Square (Lewis,1874) had an enclosed Choir of twelve stops, including a double; St.Margaret's must be content with the position of "runner-up".

There are only two references to add, on the subject of compass, to what was said on pages 189-192 concerning the Great. The Choir conformed exactly, except in the organs of Trinity College, Cambridge (Hill,1859) and St.Paul's Cathedral (Willis,1862). These were the last two examples of triple mixed compass, and it is only to be wondered at that such an anomaly was allowed to survive so late. Trinity had a CC Great, GG Choir and Gamut G Swell; St.Paul's had compasses of CCC, FFF and CC respectively.

The Solo Organ

Events moved rapidly forward from the tentative beginnings described in Chapter Two; and over thirty organs were provided with a fourth keyboard during the third quarter of the century. The Solo organ was already taking shape as a fully-fledged department with its own particular pattern and personality. By its very nature, the Solo (except in a very few organs of great size) was bound to be rather mis-
1) cellaneous in its make-up — a "fortuitous concourse of atoms" as it has been termed — but that, in itself, was no blemish, provided that the atoms were good ones. Chorus-work was of secondary importance; but even so, there were intermittent attempts to preserve a semblance of it.

The "fons et origo" of this department from its earliest in-
2) ception, at which our readers were privileged spectators, was the heavy-pressure Tuba; and so it remained. A single-stop Solo, as in the Hill organs at Turvey (c.1853) and Bath Abbey (1868) would consist of this stop only. Next in priority came the solo flute, which had become much more valuable in this capacity since the advent of harmonic construction and heavier wind; Magdalen College, Oxford (Gray and Davison, 1855) had Harmonic flute and Tuba only, as did Brompton Oratory (Bishop and Starr, 1858), the latter two stops being on six inches of wind.

Two examples of a three-stop Solo are worth mentioning: Ludlow Parish Church (Gray and Davison, 1860) had Harmonic Flute, Tuba and a

1. Clutton and Dixon, op.cit., p.101
2. vide supra, p.80.

five-rank Cornet, a rather interesting experimental throw-back, which at the same time looked ahead — perhaps unwittingly — to the modern bombarde divisions, with their battery of heavy brass and mixtures. The three Solo stops at York (Hill, 1863) were the original "railway tubas" at 16ft and 8ft, now transferred from the Swell, together with a 4ft Harmonic flute.

These were some of the smaller, more rudimentary Solo departments. At the other extreme came the Albert Hall with its twenty stops and St.George's Hall with fifteen. Between these limits lay the average Solo, which (mathematically computed) consisted of seven stops; but in actual practice the most usual Solo organs numbered five or six stops. Winchester Cathedral (Willis 1854) was out of the ordinary in two respects: its four flue-stops — Dulciana 16ft, Viola da gamba 8ft, Harmonic flute 4ft and Piccolo 2ft — seemed to be planned with some sort of ensemble in view: and its two reeds were both of the quiet, orchestral variety. The tuba had not yet passed permanently from the hands of Hill to those of Willis, though other builders were already using a Tromba, or, better still, a "Grand Tromba" as Gray and Davison termed it at the Crystal Palace, where it shared a keyboard with 8ft and 4ft Flûtes harmoniques (their origin being acknowledged in their nomenclature), a two-rank mixture and a Corno di bassetto. The more typical five-stop Solo was exemplified at the Kinnaird Hall, Dundee (Forster and Andrews, 1865) with Harmonic flutes at 8ft and 4ft, Clarinet, Orchestral oboe and Tuba. To this pattern, Willis added either a 4ft Clarion (St.Paul's Cathedral, 1872) or a Gamba (St. Michael's College, Tenbury, 1873).

The nine-stop "Orchestral Solo" organ at Leeds Town Hall was one of the many outstanding features of this remarkable instrument. In the first place, the pipes were placed horizontally and the sound-boards vertically; it was claimed that this position added twenty or thirty per cent to the tone. Moreover, all stops, except the Ophicleide, were enclosed in two separate swell-boxes with shutters on three sides. The enclosed stops were on a wind-pressure of six inches in the bass and seven in the treble; the ophicleide stood on ten inches. The "mechanical combination stops" which formed an integral part of this department, are described later in this chapter.

In the larger Solo organs, the pre-eminently reed character of the department was emphasised. Willis had ten reeds out of fifteen solo stops at St.George's Hall; the proportion fell to one-half at Alexandra Palace and the Albert Hall (seven out of fourteen, and ten out of twenty respectively). At Liverpool, the five flues were an all-flute chorus from double to 2ft; at the Palace, strings at 8ft and 4ft were added to flutes 8,8,8,4,4,2ft (note the disappearance of the double); and at the Albert Hall, there were strings 16ft and 8ft, flutes 8,8,8,4,4,2, and finally a Cymbale — a brilliant and powerful mixture.

In the reed section, St.George's Hall had a group of six

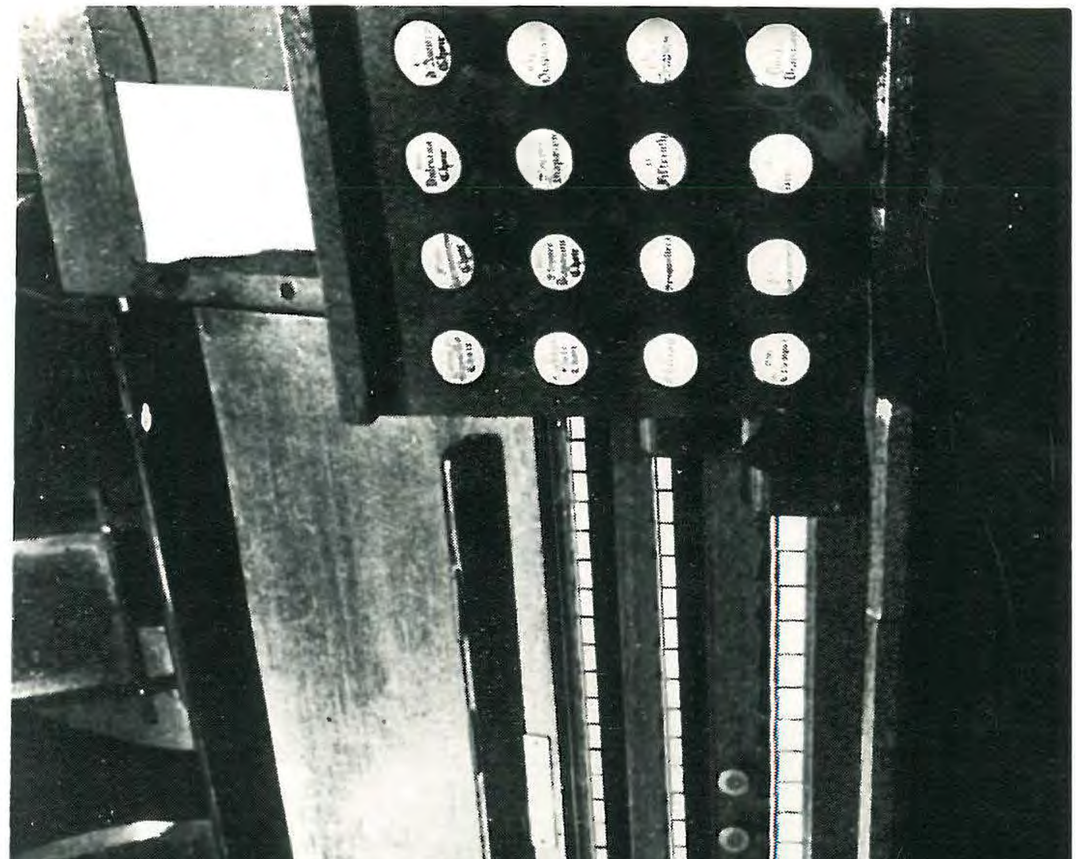

PLATE IX.

An early Father Willis console.

The organ in King's College, Strand (University of London) was built by Willis in 1854, and was therefore among his very earliest instruments. The arrangement of the stop-knobs on their straight jambs can be seen; on the right-hand jamb, the "Choir" stops are thus designated on each knob, while the Great stops bear the stop-name only. Notice the six brass pistons (a Willis "speciality") below the Great manual. This console remained in use for nearly eighty years.

(Photograph by Gilbert Benham, from Org.ID.235) chorus and orchestral stops, including 16ft and 4ft pitches, on normal wind; and four heavier stops on higher wind — 9½ inches at first, but raised to 22 inches in 1867 at Best's instigation. The seven Alexandra Palace reeds included a Trumpet on 25 inches of wind (the name Tuba did not appear either in this organ or in its Phoenix twin seven years later), and it was partly because of the magnificence of its reeds that this instrument was regarded by Stainer and many of the other great men who played it, as Willis' masterpiece. The Albert Hall, his biggest organ, was never as completely satisfactory as such a tremendous design should have been; but its Solo department had the great merit of at least partial enclosure. This was a long overdue step, whose necessity seems so obvious to us to-day that we wonder at the lateness of its eventual arrival. The five imitative orchestral reeds were enclosed in their own box, leaving the five heavy reeds on a separate open soundboard with a wind-pressure only one inch less than that of the Palace. From that day to this, the Tuba has remained unenclosed even where all its other Solo companions have withdrawn to the shelter of their swell-box; enclosed tubas will be found only in a subsidiary role in the largest organs, where the principal tuba will still stand in the open, as do the fifty-inch Tuba Magna at Liverpool Cathedral and the thirty-inch crowning glory of the present York organ.

Another modernistic trend which appeared at this time was the adoption, in a three-manual organ, of the third manual as the Solo, and the omission of any Choir. This very logical and sensible step in a concert-organ was taken at the Free Trade Hall, Manchester, by Kirtland and Jardine in 1857, and it has been frequently imitated since then, often in the present century. Often, too, the third manual comprises a flagrantly Solo group of stops, but with the name Choir retained, rather dishonestly. Where space or money restricts a concert-organ to a moderate size of, say, no more than forty stops, a well laid-out Great-Swell-Solo scheme has manifold advantages over a Great-Swell-Choir arrangement -- or, worse still, over a four-manual with about four stops each on Choir and Solo, which would very probably be the preference of a console-conscious Organ Committee who would thus give themselves a considerable increase in expense and no gain in musical value.

Mention was made, on the previous page, of the higher wind-pressures employed by Henry Willis; and, as this was the period in which heavier wind began to come into increasingly general use with the majority of leading builders, it seems appropriate at this point to quote the very pertinent remarks of Bishop Wedgwood on the subject; a great deal of misapprehension exists, even to-day, regarding the aim and object of increasing the wind-pressure, which Wedgwood's remarks may help to dispel. Undoubtedly, the technique of heavy-wind reed-voicing was one of the outstanding developments in British-built organs during the nineteenth century; and although, as we have seen, the idea had its origin before the mid-century, it was mainly after 1850 — and mainly at the hands of the Willises — that its full possibilities and advantages were demonstrated, and consequently imitated far and wide.

1) "In considering the question of wind pressures" writes Wedgwood, "it is absolutely essential, in the first place, summarily to banish the false idea that heavy wind pressure is ordinarily employed for the purpose of extracting the greatest possible amount of noise from the stops planted on it, or indeed that it is necessarily productive of great power..........The main object in the use of heavy wind pressure is the production of refined tone.

"The truth of this view.....is demonstrated by the fact that Hope-Jones, for instance, has placed in chamber organs, and small churches, reeds on ten-inch wind without any disagreeable effect resulting; and by the production of what are acknowledged to be some of the finest Swells in the country, he has demonstrated that heavy wind can successfully be used alike for reeds and flues.

2) The softest stop in the new York Minster organ (Walker), the Echo Dulciana — a mere whisper, inaudible at the keys unless absolute quiet is reigning, and a stop of exquisite quality — actually speaks on a pressure of about 8 inches. This pressure was required for the orchestral reeds and Harmonic flutes on the Solo organ, and therefore was employed also for the Dulciana. It is a fact

1. Wedgwood, op.cit., p.165.

2. i.e. the rebuild of 1903. Wedgwood's words are quoted from his second (1907) edition.

that the most competent modern voicers find that, on a wind pressure of moderate strength, it is possible to obtain greater refinement of tone and promptitude of speech than on a low pressure. Heavy wind pressure is employed, therefore, to secure refinement, not noise. In producing high notes of the utmost delicacy, vocalists and performers on wind instruments constantly employ an exceedingly high wind pressure.........

"One of the greatest advances in the tonal aspect of modern organ building has been due to the more scientific adaption of wind pressures. We no longer find up-to-date builders voicing entire organs on 2½ inch wind; and even the conventional, though absolutely absurd, use of pressures of such slight variation as Great 3½ inches, Swell 3 inches, Choir 2½ inches, is regarded with less complacency than was hitherto the case. Indeed, at the present time, the truth is gradually gaining ground that such a small differentiation of pressure is scarcely worth effecting. As I have already remarked, the swell-box acts as a kind of wet blanket on the tone, and undeniably ruins all delicate, low-pressure voicing. The only way to remedy this -- and also the disadvantages of an organ situated in an organ chamber or "coffin" -- is to employ heavier pressure........

"With the exception of the reed work, the average Swell organ is little better than the old Echo organ from which it was originally developed. It has conclusively been shown, in the case of reed-work by Willis, Hope-Jones and others, that a thick tongue is alone productive of the finest quality of tone. In order to set a thick tongue into vibration, heavy wind pressure is necessary. Heavy wind pressure, therefore, whilst also used for promoting power in the treble, is mainly employed for the purpose of securing quality rather than quantity. Reed stops should be full and smooth throughout, and (like the human voice and orchestral brass) should if possible be soft in the bass, and should gradually tend to increase in power as the pitch rises.

"Yet another testimony.......is furnished by a comparison of the Trompette harmonique as voiced by Cavaillé-Coll on 7 inch or 8 inch wind only (St.Sulpice, Paris) with a real Tuba. It will be found that in some instances the former stop is quite equal in power to a 15 inch Tuba voiced on Willis lines. The Cavaillé-Coll Trompette harmonique is merely a trumpet of "free" tone, "blown for all it is worth" (to adopt a colloquialism). Regular in tone it may be, but yet it is entirely devoid of "body"; witness for instance the specimens at the Albert Hall, Sheffield, and Town Hall, Manchester. The Tuba, on the other hand, is characterised by great fulness and purity of tone, for the production of which the surplus pressure is needful. It cannot, indeed, be too strongly urged that unless this "thick" quality is in evidence, the stop is not a true Tuba, but merely a magnified Trumpet."

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1. The reader will have gathered that Wedgwood was a fervent admirer of Hope-Jones. Remarkable as his work undoubtedly was, both as technician and tonal reformer (as Chapter Four will show), there are not many people to-day who would be prepared to speak quite so warmly about his Swells, or to couple his name quite so closely with that of Willis.

Before our attention is transferred to the fifth manual, a passing reference must be made to a stop which, though it is most commonly found on Swell or Choir nowadays, yet made its first appearance in Britain on the Solo manual of the Panopticon organ (Hill, 1853). This stop, producing one of the loveliest of all organ effects, was the Vox angelica, the off-tuned dulciana which, in combination with another dulciana or an Echo gamba, is so suggestive of massed orchestral strings. Later versions used keen Gamba ranks to give a more colourful "shimmering" blend, under the name of "Voix célestes" or "Violes célestes".

The Echo organ

This department now re-enters the stage of organ history. The reader will remember how it was originally introduced as a third manual by Father Smith at the Temple in 1683, in the course of time sinking its identity in that of the Swell. Now, during the second half of the nineteenth century, several examples of the new Echo occur, of which the earliest — on paper, at any rate — was at Leeds Town Hall. 1. Dr. Spark, however, points out that this Echo was not actually installed until 1865, having at first been omitted on financial grounds; but that it had certainly formed part of the original plan, which was the work of Henry Smart and himself. This group of six flue-stops, from 16ft up to four-rank mixture, was almost entirely flute-toned, and it did not at first have its own keyboard (that came in the 1898 rebuild)

1. Spark, "Reminiscences" p.222

but was playable from the Solo or Choir keys. Bearing Spark's statement in mind, the earliest Echo to be heard was, none the less, still in Leeds, in the fine but gloomy Parish Church, where a superb organ is entirely concealed behind a most unfortunate screen.

This organ was rebuilt jointly by Hill and Schulze in 1859, the fourth manual being the work of Schulze alone; incidentally, there is some uncertainty about its name, for it is described as "Solo" in an
1) account of the history of the church and in a well-known work on organ-building, while Spark himself refers to it as "Echo", though admittedly this was after some alterations were made in 1865, when the name may have been changed. In any case, one glance at the contents of this manual makes its real nature quite clear: twelve very quiet flute and string stops from double to three-rank mixture, no reeds — and one-and-a-half inches of wind !

It must be remembered that, whereas the Solo organ was a purely English conception and had no roots in Germany, the Echo had long been part of German tonal design, as "a smaller and softer edition
2) of the Positiv department, on light wind and on an open soundboard. It formed the third manual." But, as the same writers further point out, "Some of the stops are mere whispers and their delicate voicing is easily disturbed by dust. An Echo organ, to be really effective, requires much bolder treatment, a moderate wind pressure, and enclosure in a box." Schulze installed another example of this German type

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1. Moore, "History of Leeds Parish Church", 1877.
   Robertson, "Practical treatise on Organ building", 1897
   Spark, op.cit., p.170
2. Clutton and Dixon, op.cit., p.100

of Echo at Doncaster (1862) and a particularly lovely one at Armley (1869). Even the so-called "Solo" at Doncaster, on its own fourth manual and distinct from the Echo on the fifth, was a half-hearted affair of nine stops mainly duplexed from the Swell.

In 1873, two English builders incorporated Echo organs in instruments built by them. Vowles, at St.James', Bristol, transferred the original Smith-Hodges Swell bodily to the fourth manual under the title of Echo Swell; and at St.Martin's, Leicester (now the Cathedral) Walker gave the name of Echo to his fourth manual, containing flues 8,8,4,2ft and a Vox humana.

What might be named the "English Echo", to distinguish it from the Schulze-German type, was made famous in later years at Norwich and Westminster, and was the direct outcome of electric action's making possible a remote, concealed position for the pipes. The name Echo has occasionally been replaced by far-fetched, romantic alternatives — one of which, "Celestial organ" (in the triforium) brought forward the suggestion for a sixth manual: "Infernal organ" (in the stokehole). The first opportunity to make use of electricity in this way occurred in the much-discussed organ built for the Regent's Park residence of Mr. Nathaniel Holmes, by the firm of Bryceson and Morton to a design by W.T.Best in 1875. A chorus of six gently-voiced flue-stops, from double to three-rank mixture, was located a hundred feet away from the console, and was played from the fourth manual, which it shared with the Solo.

The Pedal Organ.

The third quarter of the century was a period of consolidation and growth in the pedal department; the compass became standardised, the number of stops increased, 32ft doubles were more common, and in every way this part of the organ enlarged its usefulness up to the point where it could fulfil all requirements — in terms of the Great organ alone. There lay the one main weakness, though neither it nor its solution was realised until the great reformer Thomas Casson appearde in the eighties, with his threefold doctrine of the Pedal's function, and his practical recommendations for fulfilling it. Meanwhile the Pedal became a much more important entity in the eyes of builders as well as composers, until it came to be regarded as next in order after Great and Swell; in our time, it has mounted one place higher still.

There were, inevitably, plenty of organs lagging behind in the forward march of progress. During this period, for instance, about eighteen per cent of Pedal organs had one stop only, and a further eleven per cent had but two. A few comments on these two groups are necessary before passing on to the more progressive instruments. In the first place, the fact that nearly a third of the Pedal organs dating from this period were, in modern eyes, woefully ill-equipped, is not such a condemnation of the fifties and sixties as it might seem. Rather must it be considered creditable that so small a proportion was found in that category. Statistics can be very wearisome things, but they have the merit of concise and lucid presentation of a question of fact; and they may help here to dispel the fog of misstatement and misapprehension generated by years of superficial generalities such as have become traditional among twentieth-century critics.

In the second quarter-century, Pedal organs of one stop (including single complete or partial ranks of pipes of whatever range, as well as pull-downs without independent pipes of their own) numbered 45% of the organs built or rebuilt then; and those of two stops, another 12%, making a total of 57%. The average number of stops in all Pedal departments was three.

The corresponding figures in the third quarter-century were 18% with one stop, 11% with two (29% in all), and an average total per Pedal organ of just under six stops. Thus there was an improvement of considerable extent under both headings; the proportion of inadequate pedals dropped by half, and the average size of the department doubled itself — a not unsatisfactory amount of progress in less than a generation. Yet the nineteenth century is far too frequently made the butt of scornful criticism for its alleged shortcomings in relation to the mid-twentieth-century instrument, instead of being weighed against its eighteenth-century predecessors and indeed against its own development at successive stages of the nineteenth century. The lack of an objectively discriminating sense of historical judgement has resulted in a mass of injustice being heaped upon a period which should be looked upon as the Golden Age of British organ-building.

In the single-stop Pedal, the Open diapason was the choice in most cases — the direct descendant of the large-scaled open wood "Pedal pipes" of recent memory — though in the early seventies, the Bourdon was beginning to take its place. Hill's organ at Trinity College, Cambridge (1855) had a 32ft Sub-bourdon as its solitary Pedal stop — an odd procedure; one wonders whether it was due to the fancy of Dr.Walmisley, who supervised the rebuild.

Another oddity was found at St.George's, Hanover Square, which Hill in 1865 provided with the World's Smallest Pedal Department (such a record deserves capital letters !) of one pipe. Hopkins' description of it is mystifying in the extreme; in his specification, he writes

"Pedal, one pipe, viz. CCC to F".

This looks at first like another record — the World's Largest Polyphone — but the explanation is that the pedalboard consisted of thirty pulldowns operating on the Great keys, which were of the old GG long-octave compass without the GG sharp. Hill supplied an independent GG sharp pipe to make good the deficiency in the Pedal compass.

Among the two-stop Pedals, apart from two early examples in the fifties consisting of Open diapasons at 24ft and 12ft pitch on FFF pedalboards, the partnership of Diapason and Bourdon was virtually unbroken. At St.Botolph's, Aldersgate (Bryceson,1872), the Bourdon was derived from the Swell, one of the first British examples of borrowing on the Pedal, a device which Schulze had introduced into this country at the 1851 Exhibition, but which British builders had been slow to adopt themselves. Casson would certainly have approved of Bryceson for thus making a soft, enclosed stop available in the Pedal department; here, at once, was the suitable base for the quiet Swell manual stops, as expressive as they were.

An interesting illustration of the fact that the Pedal's adequacy was not yet regarded as an absolute necessity in the early sixties, was provided by Willis who, in rebuilding the St.Paul's Cathedral for the first time (1862), put in only two Pedal stops — Open diapason and Violone — to support thirty-two manual stops. However, there are several indications that Willis was restricted, either financially or (as so often happens at St.Paul's) architecturally in his design; the mixed compass, for instance, was something that he would not have used of his own free will, and in many ways this scheme does not seem to be pure Willis. However, within ten years he was given the opportunity to set all this right; the 1862 organ was not really worthy either of its building or its period.

Before going on now to make a survey of the larger Pedal departments of the time, it will be of interest briefly to examine the average five and six stop Pedal. Among so small a number of stops, the diversity of tonal schemes is surprising, but the one that found most favour in the five-stop group was composed of three 16ft stops (Open wood, Open metal often of the violone type, and a bourdon), 8ft Principal and 16ft reed; and this pattern, with a 4ft Fifteenth added, was likewise the most frequent among the six-stop Pedals. The importance of the reed was everywhere recognised; in fact, it was present in more than half of even the four-stop departments (Best's four Pedal stops in Willis' organ at Wallasey in 1861 had two reeds at 16ft and 8ft). In five-stop Pedals, the reed was included in more than 85% of cases, and in six-stop Pedals, the reed was invariably present.

The mixture almost disappeared from this size of Pedal organ; the Hill "six-stop model" which had enjoyed such a vogue in the earlier period, now surrendered its mixture in favour of an additional 16ft stop, with consequent loss rather than gain. Nowhere more than on the Pedal was there a need for a mixture to give to the foundation-stops what Hopkins described as "a distinctness and clearness of effect in the bass, especially necessary in the quick enunciation of the larger pipes". As for the 32ft Double, it also was a very rare constituent of these smaller departments.

Turning now to the larger Pedal divisions, we find that the fault referred to in the opening paragraph on page 229 — that this section of the organ was conceived in terms of the Great only — was becoming more apparent and less excusable. At St.George's Hall, the seventeen Pedal stops must have sounded thrilling as a bass to the more powerful Great and full-Swell effects, or in thundering-out a Bach Pedal solo — there were two 32ft flues, two large mixtures and five reeds from 32ft to 4ft, inter alia — but the player was left with precious little in the way of suitable accompaniment for the many quiet stops in which the Swell and Choir abounded. The general attitude of builders and their clients was that the Pedal must be a big, imposing, majestic section of the instrument; and this outlook is typified by the epithet "grand" which was applied to so many Pedal stops, and which Gray and Davison sometimes carried to the absurd extreme of affixing to every Pedal stop, as at St.Sepulchre's, Holborn in 1855. It is hard for us to regard a "Grand Fifteenth, 4ft" with quite the same awe and reverence that its makers must have intended.

The absence of mixtures from smaller Pedals was referred to on the previous page; and even in the nine-to-twelve-stop group, there are nearly as many without mixtures as with. Only in Pedal organs of thirteen stops or over does the mixture find an invariable place; and it is somewhat surprising to find that the largest mixture-less Pedals of the period were both of Continental origin — none other than Schulze's twelve stops at Armley and Cavaillé-Coll's at Sheffield.

The Leeds Town Hall Pedal was typical of the larger organs, and was, like St.George's Hall, a splendid scheme apart from its lack of "suitable bass" for the quieter, enclosed manual stops. In its sixteen stops, there were open and stopped 32ft doubles, four unisons (open wood and metal, violone and bourdon), quint, 8ft diapason and string stops, twelfth, fifteenth and five-rank mixture, with reeds 32,16,16,8ft. The largest Pedal of the period was, however, Schulze's at Doncaster (1862) with its twenty-five stops, and it certainly came much nearer the ideal for which Casson was to fight so valiantly and so successfully later. For example, its five unison 16ft stops had three different "strengths" in open ranks, apart from the Violone and the Bourdon; there were abundant mutations and eight reeds.

What contributed greatly to the success of Schulze's Pedal in this and in his smaller organs was the free use he made of "derived" stops, i.e. "borrowing" whole ranks from the manuals, or "extending" existing Pedal ranks for use at higher or lower pitches than the original. This, of course, was the ideal -- and at the same time the economical -- way of increasing the tonal resources and of obtaining a suitable bass. Schulze had first demonstrated this system in his 1851 Exhibition organ, in which three out of the five Pedal stops were borrowed from the Great. Another example was at St.Mary's, Tyne Dock in 1864, where the four Pedal stops were formed from two extended ranks, to which a third rank added two more stops in 1874. One of the earliest British builders to imitate this technique was Brindley, at Boston Parish Church in 1871; the 8ft Principal, Bass flute and Trumpet were each borrowed, or at least extended, from their 16ft register.

The ten-stop Pedal organ which Holdich installed at Lichfield during his 1860 rebuild has become well-known for its association with the remark made by Samuel Spofforth, the Cathedral organist at the time: "You may put them there" he said, "but I shall never use them." In all fairness to the poor old gentleman, it should be pointed out
1) that he was then eighty years old, and had been playing on Samuel Green's 1790 organ for the previous fifty-three years; it was too much to expect him to start dealing with newfangled contraptions at his time of life. Thus Holdich's pedals remained quiescent for four more years — unless some bold young assistant dared to set venturesome foot upon them.

Another example of elderly obstinacy, less forgivable in a comparative youngster of seventy-five and in a man in his position at
2) the centre of London's musical world, was Sir George Smart, organist at two Coronations, at the second of which (Victoria's) he had received a fee of £300. One day at the Exhibition in 1851, on being invited to try one of the organs fitted with a pedalboard, he retorted: "My dear Sir, I never in my life played upon a gridiron."

Hill's organ at York (1863) had nineteen Pedal stops, and it ably maintained the York tradition in this section of the organ which, next to the Great, was the largest department on this organ. Here was a welcome acknowledgement of improvement in the Pedal's status; in British instruments of those days, the Pedal was sometimes the

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1. J.E.West, "Cathedral Organists", p.46
2. W.L.Sumner, "The Organ", p.176.

third in point of size — but second, never. The German-built Doncaster organ was an exception; its Pedal was larger than any of the manual departments, and its influence was a force towards a general awakening of fresh ideas on the subject.

A curious feature of the Pedal on Walker's admirable rebuild at Radley College in 1868, was the nomenclature and the tonal plan of the fluework, which was treated from the basis of an 8ft unison, instead of the Pedal's normal 16ft. Thus, the 32ft was a "Double double open diapason", the two 16ft stops were "Double open diapasons", the 8ft and 4ft were "Open diapason" and "Principal" — and then came two almost unique stops for a British Pedal organ, the "Twelfth 2 2/3ft" and "Fifteenth 2ft" (which should actually have been labelled "Nineteenth" and "Twenty-second"), stops which never normally appear as separate Pedal ranks, but as part of a compound stop, if at all. The 16ft and 8ft reeds were similarly miscalled. The presence of such high-pitched ranks in addition to the four-rank mixture cannot have improved the balance of the flue-chorus, which had only two unison flues out of eight. This was a venture that had no imitators, though the Radley stops remained until their removal in the 1896 rebuild.

Both at Alexandra Palace and the Royal Albert Hall, Willis included three 32ft flues: open wood, open metal and Sub-bourdon. But these two large Pedal departments, of sixteen and twenty-one stops respectively, were noticeably weak in 8ft registers, each having only two — both of them open metal, with no flute tone. A much better-distributed scheme was that of Queen's College, Oxford (Walker 1866) which had a 32ft open, 16ft diapason, string and flute stops, 8ft of the same three categories, mixture, and reeds at 16ft and 8ft: it would be difficult to find a better ten-stop scheme of its period.

Willis' second appearance at St.Paul's Cathedral, in 1872, was much more creditable than his first: the Pedal now included flue and reed doubles, in a total of nine registers only. (Leeds Parish Church, by Hill and Schulze in 1859, was the only other Pedal to include two such doubles among so few stops). But unfortunately it contained no flute stops whatsoever; the bourdon undoubtedly has its faults, if not voiced with the utmost care, but it certainly deserves its place, and has its own definite role which neither an Open diapason nor a Violone, however excellent, can properly fill. There was, in
1) this case, an explanation; for we are told that "the Pedal organ was in a cramped position.........the 32ft pipes required great holes to be cut in the stone foundations, and the bourdon had to be omitted on account of lack of room."

Hill's Pedal organ at Worcester Cathedral in 1874, with its thirteen stops, was a worthy successor to one of the earliest of his admirable "six-stop models" of thirty-two years before. This new scheme had two 32ft open stops, four 16ft flues, Diapason and 'Cello

1. W.L.Sumner, "The Organs of St.Paul's Cathedral", p.21

at 8ft, Twelfth, Fifteenth, Mixture, and reeds at 16ft and 8ft. (Perhaps an 8ft flute would have been of more all-round usefulness than, say, the Twelfth).

Finally, there was the nine-stop scheme by Lewis at St.Peter's, Eaton Square, also in 1874. This was about as comprehensive as it was possible to be within the limits of that number of registers: diapason, string, flute and reed at 16ft and 8ft pitches -- no 32ft, but instead a Quint 10 2/3ft, which could at least give an acoustic suggestion of sub-foundation, and which was included in a large number of the bigger Pedal organs. The "resultant" or "acoustic" stop was yet to arrive in Great Britain, though active experiments had been going on in Ger-
1) many since the days of the Abbé Vogler at the end of the eighteenth century.

The 30-note compass, from CCC to F, rapidly established itself as the practically uncontested favourite after 1860 or so. For the final choice of F as the upper extremity of the board, no doubt the credit must be ascribed mainly to J.S.Bach and his well-known Toccata in that key. Briefly to sum-up the position, from 1851 to 1860 seven different compasses were in use, but by far the most common were CCC-F (44% of cases) and 29-notes CCC-E (25%). But from 1861 onwards to 1875, the percentages changed to 86 and 9 respectively. The 32-note CCC-G compass, so popular in modern days, remained very scarce indeed for the time being.

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1. Wedgwood, op.cit., p.1

The Action.

Chapter Two has recounted the beginnings of pneumatic action, or at least that particular type of it which was more precisely known as the Pneumatic lever. During the twenty-five-year period of the present chapter, we shall witness the arrival of two other actions, tubular-pneumatic and electro-pneumatic, which were in due course to replace the lever. The latter, however, maintains a clear supremacy among the "assisted" actions for some time yet.

It must be borne in mind that the pneumatic-lever action had but one main advantage over tracker (though it was a vitally important one), namely the lightening of the touch and the setting-free of the fingers from the dead weight of the mechanism, especially when intermanual couplers were in use. Apart from this, the action-mechanism still remained, in all its bulkiness; the console was still anchored to the instrument; the pipework had still to be concentrated in one single mass; and sudden climatic changes could still wreak havoc upon both key and stop action. Added to this, there was one drawback peculiar to the Barker-lever: there was a considerable amount of rattling in the coupler-mechanism connected to the Great, caused by the suddenly-inflated pneumatic bellows (or motors, as they were called) coming to an abrupt stop at the end of their travel. The procedure in most organs fitted with this action was for it to be applied to the Great, and its couplers, only — i.e. Swell-to-Great, Choir-to-Great, Swell-suboctave-to-Great and Swell-superoctave-to-Great. The Swell and Choir were thus free of couplers (the very useful Swell-to-Choir had not yet come into general acceptance) and were usually left in possession of their tracker action. Willis went a little further, and often applied the lever to the Swell also, while St.George's Hall, Liverpool, had all four manuals thus equipped; Leeds Town Hall followed the Liverpool example in this respect.

When the Great was being used in conjunction with all its couplers, the noise was diabolical, and prompted urgent research into some means of eliminating it. Henry Willis patented his "pressure pneumatic lever" in 1853 which included a "check-valve" to control this
1) noise, and which Audsley described as the most practical and convenient form of lever. Vincent Willis' patent for his "floating lever"
2) in 1884 was a brilliantly ingenious improvement conceived some years earlier, and only prevented from achieving universal recognition by the fact that the Willis firm changed over entirely to tubular-pneumatics soon afterwards and abandoned the lever altogether. The "floating-lever" appeared in a mere handful of organs, perhaps no more than four or five.

It is often supposed by people interested in the organ that tubular-pneumatic action followed Barker-lever in historical succession, and that electric action conveniently and neatly followed tubular. In actual fact, electric action was first used in Britain in

1. G.A.Audsley, "The Art of Organ-building", Vol.II, p.252
2. A.Thompson-Allen, Org.15.113

1868., four years before the debut of tubular; and when traced back to the earliest origins, the two actions are to all intents and purposes contemporary. A concise summary of the first practical use of tubular action is given by Professor Gabriel Bédart of Lille, in an article written in 1908.

1) "In the year 1849" he tells us, "Prosper-Antoine Moitessier, an organ-builder of Montpellier, France, patented what he called 'abrège pneumatique', an organ action in which all back-falls and rollers were replaced by tubes operated by exhaust air. In 1850 he built with this action an organ of 42 speaking steps for the Church of Notre Dame de la Dalbade, at Toulouse. In 1866, Fermis, schoolmaster and village organist of Hauterive near Toulouse, improved on Moitessier's action by combining tubes conveying compressed air with the Barker lever. An organ was built on this system for the Paris Exhibition of 1867, which came under the notice of Henry Willis, by which he was so struck that he was stimulated to experiment and develop his action which culminated in the St.Paul's organ in 1872."

These early steps, though taking place in France, were so directly the forerunners of Willis' own developments that a few more details about the Dalbade organ may be quoted from the original French specification, which will clarify the exact nature of this action.

2) "All backfalls and rollers are replaced by tubes — each key has its own tube — and no matter how great the distance to be covered

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1. Quoted in W.L.Sumner, "The Organ", p.314
2. J.W.Hinton, "Organ Construction", p.115

between key and pallet, the mechanism cannot become more heavy or complicated: it is only necessary to provide a longer tube."

1) Audsley quotes copiously from a patent taken out in 1869 by one H.H.Fulbrook of Tooting, Surrey, who claimed to have invented the tubular-pneumatic system. His description, as set out in his Provisional Specification, certainly embraced the essential principles on which all later forms of the action were based, but his system cannot be ascribed any priority in view of the earlier French experiments and patents. Furthermore, Willis was already working-out his own version
2) of the action, and had indeed taken out his own patent for tubular-pneumatic action in 1868.

Willis' new action came at a very convenient time, for in
3) 1870 the St.Paul's Cathedral authorities decided to rearrange the choir and organ in order to make better use of the space beneath the dome for all services. Ever since the central organ-screen and case had been removed in 1860, various measures had been tried for coping with the greatly-increased congregations; and the burying of the organ under the second arch on the north side of the Choir, on a reduced wind-pressure of 2½ inches, did not help matters. The large four-manual Hill organ from the Panopticon of Science and Art in Leicester Square was purchased (for five hundred pounds — not a bad bargain for a 58-stop instrument only six years old) and placed on a gallery in the south transept; but such an expedient could not be a permanent sol-

1. Audsley, op.cit., Vol.II, pp.264 foll.
2. Org.3.254
3. Sumner, "The Organs of St.Paul's Cathedral", pp.19-21

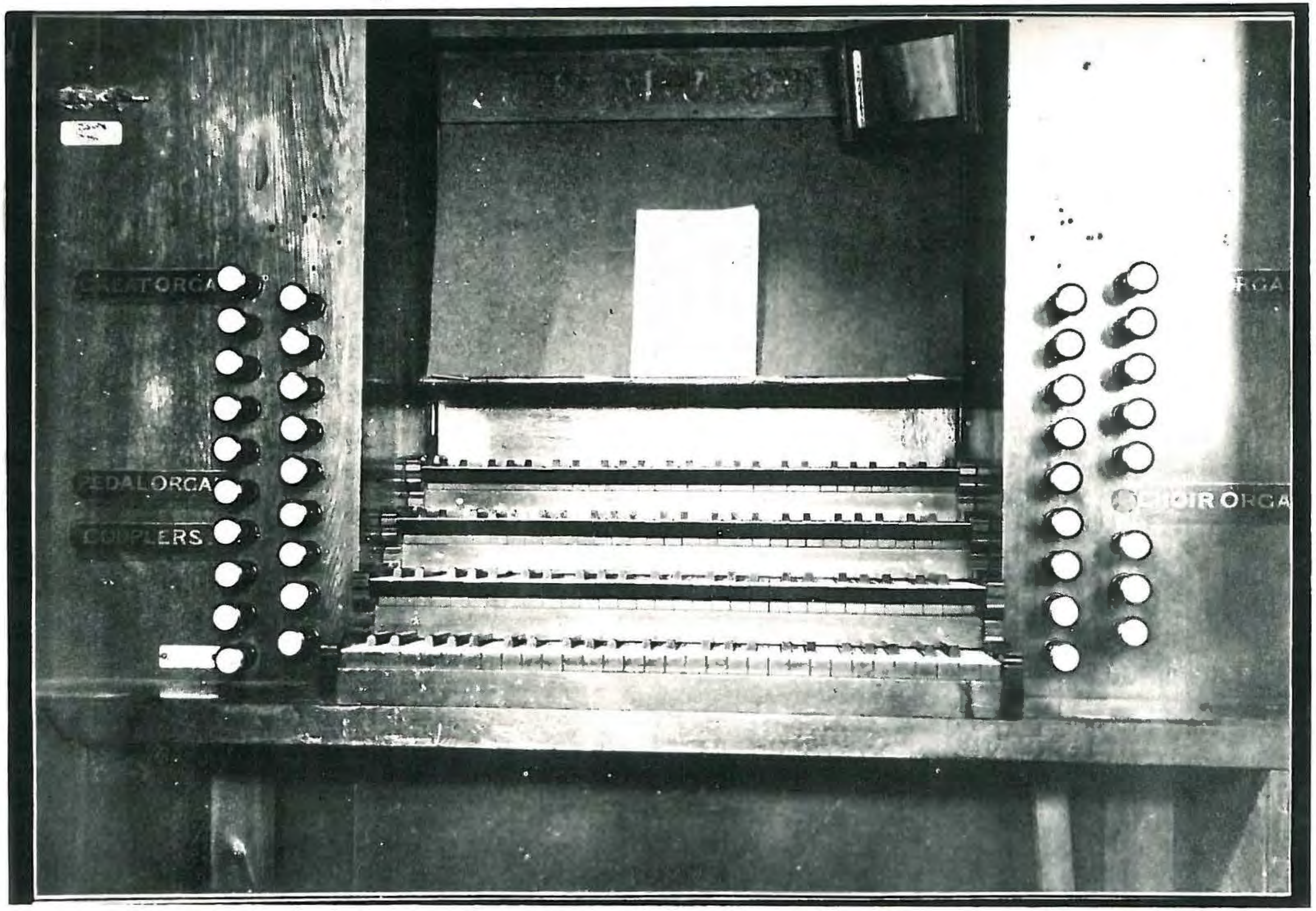
EDALORGA
PLERS
HOIR ORGA

PLATE X.

Turvey Parish Church: the console.

This village church, between Bedford and Northampton, contains an early four-manual twenty-seven-stop Hill organ, presented to the church in 1855. The basis of this instrument was formed by the sixteen-stop two-manual exhibited by Hill in the Great Exhibition of 1851. This Hill console of 1855 provides an interesting comparison with the Willis console of 1854 shown in Plate IX.

(Photograph by Gilbert Benham, from Org.13.239) ution. The decision was taken in 1870 to divide the organ between the westernmost bays on each side of the Choir; the north side was to be clothed in the west front of Gibbons' original case together with the original Choir-organ case, and the south side would have Gibbons' east front and a replica of the Choir-organ case (which, of course, had only one original front.)

Whoever conceived the idea of dividing the organ, in order to bring it as far west as possible without obstructing the main vista, (and it was a solution which in such an acoustically difficult building has proved as successful as can be expected ever since, with the aid of additional stops in the eastern quarter-galleries of the dome), the credit for carrying it out effectively must rest with Willis himself, for it was only through his tubular-pneumatic action that such a division and re-distribution of pipework and mechanism became feasible.

Most of the remaining disadvantages of the tracker and lever actions were now swept away; the tubing could be laid almost anywhere: up slopes or even vertically, curving round columns at any desired angles and in any desired direction. Consoles could be detached more freely, organs located in a much wider variety of positions. Care had to be taken not to operate the action over too great a distance — about fifty feet was a safe maximum — lest the response become sluggish. This, in fact, was what did happen in some cases, with the result

that many musicians had no very high regard for the tubular system, just as the early weaknesses of electric action raised a great wall of prejudice against it; and even where the action worked perfectly, there were many who regretted the loss of that feeling of personal contact with the pipes which tracker, and to a lesser extent the lever, had afforded. Playing on this new action, as someone remarked, was like "kissing by deputy". However, it did constitute another big step forward, and, in the perfect state which it soon reached, it became and still remains an admirable action where the distance between pipes and console or between the different sections of the pipework are not too great. Indeed, near the end of the century, Messrs Hill
1) were claiming that they could "make the most perfect repetition through a tube approaching 100 feet in length, a distance which covers practically the whole limit of distance ever required or desirable between keyboards and organ". As long as this action remained in a good state of repair, it had most of the advantages of electricity, except that the latter could be used over longer distances; but, of course, it is only with electricity's aid that one can surround one's console with coloured lights and go up and down on a lift -- an ecstatic experience which is beyond the scope of pneumatics.

Other builders hastened to take up this new tubular mechanism; Hill, for example, applied it to the Pedal department of the new organ at St.Margaret's, Anfield, Liverpool in 1875. Here, the Swell and

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1. Elliston, "Organs and Tuning", p.135

Choir were tracker and the Great was Barker-lever. There are references, scattered here and there through the pages of organ literature, to tubular-pneumatic actions in use at dates earlier than Willis' — in some cases, more than twenty years earlier; but none of these are in the slightest degree substantiated, and are all of them solitary instances unsupported by any kind of cross-reference. They are, in fact, blatantly obvious errors, due either to careless inaccuracy on the part of writers whose technological zeal to impart details of pipe-scales and mixture-breaks is greater than their historical knowledge or interest, or else to an even more lamentable — but not uncommon — inability to distinguish between different types of pneumatic action. The label "pneumatic" is used loosely to denote the lever as well as the tube; and quite a number of organ-amateurs are under the unshakeable impression that "pneumatic" and "tubular" are synonymous and interchangeable.

Nevertheless there seems to have been at least one organ in which the tubular action was used prior to St.Paul's Cathedral; this we know on the authority of W.L.Sumner, whose word may be accepted as unimpeachable. The organ in St.Mary's Church, Nottingham, was rebuilt by Bishop and Starr in 1871, and was similarly equipped to the Anfield instrument of two years later — with tubular-pneumatic to the Pedal. However, it is odd that Sumner did not make any comment, even in passing, on this almost uniquely early use of the revolutionary new action in Britain, especially as the Nottingham date is a year in advance of what is widely held to have been its début. But, of course, one could go back much further; for have we not seen that Booth's "puffs" at Attercliffe in 1827 were nothing more nor less than rudimentary tubular pneumatic in principle?

In turning from this first conception of the tubular mechanism to a similar stage in the genesis of electric, the reader may be surprised to find himself taken one year back instead of several decades forward. Yet it was in 1826 that the electro-magnet was invented by William Sturgeon; and in collaboration with an organ-builder friend, William Wilkinson of Kendal (whose business is still prospering in
1) that town to-day) he carried out experiments to try and open the pallets of an organ by electrical means; but the resistance was too heavy to be overcome by electric power derived from batteries, and there the matter had to rest — for the moment.

There is no record of any further move for the next twenty years and more. According to a notice in the "Orchestra" for May 26th,
2) 1866, Dr.Gauntlett at the time of the 1851 Exhibition proposed a scheme for playing all the organs in the place at one and the same time. This plan was opposed, and nothing came of it. Shortly afterwards, when the Exhibition building moved south and became the Crystal Palace, Gauntlett proposed that facsimiles of eight of the most celebrated organs in Europe be erected at different parts of the building

1. Sumner, "The Organ", p.316
2. Hopkins and Rimbault, p.74

and played from some central point. This was again rejected, in an unnecessarily blunt and discourteous fashion, and Gauntlett had to content himself with taking out a patent in 1852 for an action which, as Audsley points out, is electro-magnetic rather than electro-pneum-
1) atic, "for no use is made of a pneumatic auxiliary, and herein lay

its complete failure from a practical point of view. His magnets are placed within the pallet-box of the wind-chest, and act directly on iron armatures attached to the free ends of the pallets. Under this arrangement the magnets have to be sufficiently powerful to pull open the pallets against the combined pressure of the organ-wind and their recovering springs. Dr.Gauntlett made a great mistake in not using some pneumatic motor in conjunction with his electro-magnet, and thereby rendering a large and very powerful magnet unnecessary."

Another electro-magnetic patent was taken out in 1865 by J.W.
2) Goundry; and this, according to Audsley, was "a slight improvement

on that patented by Dr.Gauntlett, his electro-magnets acting directly on relief pallets instead of on ordinary solid ones as used by Dr.Gauntlett. The pneumatic-lever is, however, mentioned, and a form given for its application."

At this point, the tale is taken up by Charles Spackman Bar-
3) ker himself. The previous passage quoted from his pen is followed by

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1. Audsley, op.cit., II,p.706
2. ibid., II,p.708
3. vide supra, pp.104-8

remarks on the defects to which the ordinary tracker and pneumatic-lever actions were subject, owing to "atmospheric, or to speak more exactly, hygrometric influence." Regulating screws or nuts, which were provided to make the necessary adjustments for remedying these faults, only increased the complication of the mechanism. So, we read,

1) "it occurred to Mr. Barker, as it already had to many others, that seeing what has been accomplished in telegraphy, by which the most delicate movements are transmitted to indefinite distances, with rapidity and precision, it might be possible to apply the same principle to the organ, in which the keyboard represents the manipulator and the pallets of the organ the receptors of the telegraphy bureaux. Now this has been actually and successfully accomplished by Mr.Barker in presence of repeated and uniform failure on the part of his predecessors. The reasons for this will appear in the course of the explanations of his system , as applied by Mr.Barker in France to the large St. Augustin organ, in which the keyboards have not offered the slightest derangement although the instrument has been erected more than a twelvemonth, and consequently has been during that time subject to great vicissitudes of temperature. The application of Mr.Barker's patent in England by Messrs.Bryceson Brothers and Co. have been equally successful.

"An essential condition in the electric transmission in the

1. Hopkins and Rimbault, pp.73-4

organ, and which had been generally overlooked by Mr.Barker's predecessors in this direction is to diminish the resistance of the pallets to a minimum by means of a peculiar construction, or to attack them by the intervention of a pneumatic lever reduced to a simple inflating bellows and debarrassed of all its usual accessories in the shape of couplers, etc., which can now be all affected electrically.

"This new system offers three inestimable advantages in its application:-

(1) A great simplification by the suppression of a multitude of moving parts, replaced by simple insulated wires.

(2) The possibility of transmitting the movements to any required distance irrespective of the relative positions of the organ and its keyboard.

(3) The invariability of the keyboards under the greatest changes of temperature.

"It is now about five years since Mr.Barker made his first experiment for the application of electricity to the organ, and proposed applying it to the large organ which he had just received the order to construct for the Church of St.Augustin, upon the favourable report of the commission charged to examine the new mode of construction. This organ was opened about three months since, and the commission having made another and final report in most favourable terms, Mr.Barker is now charged with the construction of another large organ for the new church of St.François de Xavier, which, with those of St.Augustin, Salons and Montrouge, is the fourth application of the electric principle in France."

A splendid testimony to the excellence of Barker's system is afforded by a remark of Dr. Peschard's, who had co-operated with Barker in his experiments.[1] "The opening of the electric organ at Salon

> took place in 1866. It was completely successful from the start, and to-day, after twenty-four years' use, this instrument of two manuals, Pedal and the usual couplers, still functions without the slightest trouble. M.Payan, who has played it since its erection, goes so far as to assure me that the electrical parts of it seem as new as on the day they were made."

The Bryceson connection with Barker began at the Exposition Universelle in Paris in 1867 (what a fruitful Exhibition this was for the history of organ-building — the outcome of Willis' visit to it has already been related) at which the firm of Bryceson Brothers and Morton were themselves exhibiting. Henry Bryceson was shown the then nearly-completed organ at the church of St.Augustin, and was so impressed with its possibilities that he at once negotiated with Barker for the rights to use his patented action in England. After what must have been extraordinarily rapid experiments, the British firm produced an improved form of Barker's electro-pneumatic mechanism, and installed

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1. Dr.Albert Peschard, "Les Premières Applications d'Electricité aux Grands Orgues", Paris 1890. Quoted by Audsley, II, pp. 708-9. (It will be noted that Peschard does not receive a mention in the Barker despatches.)

the first electric organ in England at

1) "Her Majesty's Opera, Theatre Royal, Drury Lane, carried on there on account of the destruction of the old house in 1867. This organ, erected within three months of the time he obtained the concession from Mr.Barker, was placed behind the scenery on the O.P.side, fifty feet away from the keyboard, which was in the orchestra, where the organist could see the conductor and instantaneously realise his suggestions and directions. It was first publicly used the 29th of May 1868 and continued in operation till the end of the season without the slightest derangement or requiring attention. He then erected it in the Polytechnic Institution, Regent Street, where it has been performed on twice daily ever since. This was the first organ which had an electric drawstop-action and a cable of insulated wire through which it was played ....

"The next was built for Christ Church, Camberwell. It contains two manuals and independent pedal organ, twenty sounding stops and five couplers. It stands above the vestry, in a chamber on the south side of the chancel, and the console is on the opposite side amongst the stalls for the choir; fifty-five feet of cable intervenes, and runs beneath the encaustic tiles, passing through a drainpipe provided for it. Exhaust is used for the key pneumatics, and exhaust and pressure for the drawstop-action. This organ was previously erected for the Festival, Gloucester Cathedral September 7th, 1868.

1. Hopkins and Rimbault, p.87.

"Mr. Bryceson has also just completed the reconstruction of the large organ in St.Michael's, Cornhill. This fine instrument contains three manuals, and independent pedal organ, thirty-seven sounding stops, and seven couplers. The console is opposite, and facing the organ at a distance of thirty feet, thus placing the choir between the organist and organ. The cable contains 336 insulated wires and measures 1½ inch in diameter; it is carried through a small drainpipe under the chancel floor, and this constitutes, with the exception of the lead pipe for the swell cylinders, the only connection between the organ and the console. Exhaust is used for the key-pneumatics, and exhaust only for the drawstop-action. He is also finishing a large electric organ for St.George's Church, Tufnell Park, to be placed over the west door, and he has others in course of construction for St.Augustine's Church, Highbury, Minley Manor near Farnborough, and Her Majesty's New Opera-House, Haymarket, all on the electric system."

This quotation has been given at length, despite its air of advertisement (and it was in all probability written by Bryceson himself and reproduced verbatim by Hopkins), as it shows how rapidly events moved in the early months of the new electric action. Hopkins' (or Bryceson's) words were published in 1870, and they must therefore refer to the activities of the firm during less than two years since the original meeting between Barker and Bryceson.

Despite this propitious beginning, there was soon afterwards to be what is euphemistically called, in the language of present-day economics, a "recession" in electric-organ-building. This occurred during the period to be described in Chapter Four, but a few lines may be devoted here to the defects in the Barker-Bryceson action which led to these early setbacks. The main trouble, according to a recent auth-
1) ority, lay in the "great cost of battery-maintenance. Purchasers

> then, as now, looked to cost, and as Messrs. Bryceson's system required an exhaust as well as a pressure bellows, the cost both of the installation and of hand-blowing was increased.........."

A modern reader may find this combination of electric action and hand-blowing difficult to swallow, but there it was ! Moreover, the batteries were a constant source of trouble, and they, more than any other factor, were responsible for the "shelving" of electric action until a solution was eventually found in the shape of the low-voltage generator coupled to the motor which drove the fan. Organists became exasperated by repeated battery-failures which seemed always to occur at the crucial points of important services; and even in
2) 1894 we find a writer expressing himself in the most dubious and cautious terms about electro-pneumatics.

Meanwhile, Bryceson's masterpiece was built in the closing years of our present period, and may fittingly bring this part of the chapter to an end. It was a large four-manual organ built for the

1. Reginald Whitworth, Org.5.211-2.
2. Thomas Elliston, "Organs and Tuning", pp.12-13.

residence of Mr. Nathaniel Holmes in Regent's Park. The construction of it occupied three years, from 1872 to 1875, and W.T.Best had a hand in its design; it was a very comprehensively-planned concert organ, with detached and reversed console, and included full-length 32ft diapason and reed stops. Most of the action was Barker-lever and tracker, but there was also an electrically-operated Echo department of six stops, played from the Solo manual. These pipes were bracketted out from the wall at the other end of the hall, about a hundred feet from the console. The organ was later moved to the Albert Palace, Battersea, where it spent the years 1884 to 1894 in regular use; and on the demolition of this building it was purchased by the monks of St.Benedict's Abbey, Fort Augustus. There it was stored in a state of "suspended animation" while the new church was being built; and it was finally re-born as a large modern four-manual in 1936, a happy ending to the story of a famous instrument.

Mr. E.H.Lawton, the Aberdeen organ-builder who was in charge of its maintenance at the Abbey for many years and of its final reconstruction, in a most interesting account of the organ and its history, mentioned that

1) "the earthenware cells of the bichromate battery were knocking about the monastery for many years — they were as big as wash-house boilers !"

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1. "Musical Opinion", December 1936.

The Console

Until the third quarter of this nineteenth century, the word "console" had not yet come into use in its application to the organ; nor indeed was there any need for a special word as long as there was no such thing as a separate location for the player away from his instrument — except for the very few tracker "long movements" already mentioned. It was only when detached and (later) movable consoles became less rare that the need was felt for a new name.

Many are the suggestions that have been offered regarding the first appearance of the word in its new sense; it had already acquired definite connotations of meaning in architectural and furnishing contexts. The "New English Dictionary", for example, assigns the earliest use of the word to C.A.Edwards in his "Organs and Organ-Building" in 1881; this theory does not speak very highly for the Dictionary's powers of research, but it is in keeping with the inaccuracy of many similar pronouncements by writers on this subject.

The second edition of Hopkins and Rimbault's treatise, published in 1870, still uses the old phrases "key-boards", "keys" and "sets of keys" throughout the chapters reprinted from the 1855 edition. But there is, in the second edition, a newly-added chapter on "Electric action", and the word "console" is used several times during the course of it, namely on pages 76, 81, 84, 85, 86 and 87. (The pages are enumerated in detail because at least one other writer has
1) declared that "in the second edition of 1870, the omission of the

1. Orlando Mansfield, Org.2.150

word is somewhat disappointing as this particular edition contains a special chapter upon the electric organ.")

What is particularly interesting is the way in which the word, on its initial appearance, is introduced and defined by Hopkins (or is it Bryceson ?) exactly as one would explain a newly-coined technical term:

1) "A sound-board, therefore, with its electro-pneumatic power-bellows applied to both pallets and sliders, requires no train of moving mechanism to connect it to the key-board and draw-stop knobs, however distant, but simply the necessary number of insulated copper wires to conduct the electric current from the console, or stand, which holds the manuals, pedals, etc. The console, thus detached from the main body of the instrument, contains a vast amount of accurate and beautifully-arranged work. Its dimensions may be compared to those of a large harmonium......."

However, a still earlier reference exists. In a book describing the instruments of the 1851 Exhibition, and published in that
2) very year, there occurs the following passage, concerning the organ by Ducroequet of Paris:

"The claviers are fixed in a detached upright console, the player sitting with his back turned to the instrument itself."

The word is not printed in italics or with inverted commas nor is there any word of explanation or comment, so that it may be inferred

1. Hopkins and Rimbault, p. 76

2. Dr. William Pole, "Musical Instruments in the Great Industrial Exhibition of 1851". Dr. Pole, incidentally, is another versatile character of the Dr. Hodges type, who likewise deserves a book to himself.

that this meaning of the word was not unfamiliar to British readers even then.

The word "manual" was another which acquired its new meaning at this period; the "New English Dictionary" — and perhaps it is more accurate on this occasion ! — records 1852, in an English trans-
1) lation of a German work on organ-building, as the first known example of its use. The "Musical Times" has the word for the first time in
2) January 1865, in an organ-builder's advertisement.

A further handful of "long movements" may now be added to those named in previous chapters, before we approach the time when the advent of electricity made detached consoles more plentiful. Ely Cathedral (Hill 1851) had most of its pipework in the north choir triforium, with the console on a stone gallery behind the top of the choir stalls. At Holy Trinity, Manchester (Kirtland and Jardine 1852) the keys were twenty-five feet from the organ, but the touch, according to Hopkins, was "remarkably crisp and pleasant," presumably with the aid of the Barker-lever. The interesting Wallasey organ (Willis 1861, to Best's design) had a reversed, and therefore detached, console: but the distance must have been short, as tracker action was used although Willis' lever action had by then reached a high state of development. Finally, there was St.George's, Brandon Hill, Bristol, where in 1874 Vowles used a long tracker action to connect the console

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1. J.J.Seidel, "Die Orgel und ihr Bau"
2. Quoted in Scholes, "Mirror of Music", p.579

on floor level at the south side of the chancel with the pipework in the gallery above.

All these, however, became mere museum-pieces with the introduction of electricity. The paragraphs under the heading of "The Action" on pages 252 and 255 have fully described the earliest detached consoles operated by this system. Another prominent example, also by Bryceson, was at Rugby School Chapel in 1872, where the pipework was over the vestry on the north side of the chancel, and the console just below the pulpit on the south side — an admirable location for it. Unfortunately, as with so many of the early electric organs, the usual defects arose and resulted in a return to pneumatics — and an attached console, alas ! — in 1897. Thus the organist has remained ever since in the worst possible position for performing his duties (though that fact has not prevented Rugby from being one of England's finest training-grounds for young organists.)

Another type of console-detachment, which modern builders are finding invaluable in large churches where services are held in widely-separated parts of the building, is the duplication of consoles. This device was originally intended rather for display purposes than for the more practical and sensible end in view nowadays, and the Apollonicon "wonder organ" had been the first of the kind, with five or six separate keyboards. Its first-born descendant was the organ in the Panopticon of Science and Art in Leicester Square. This was a 60-stop 4-manual built by Hill in 1853, and it was certainly the largest and most complete instrument in the South of England until the Crystal Palace organ was opened four years later. It contained a number of improvements in mechanism which will receive due mention in the next few pages; and its most noticeable novelty, even to the layman, was the provision of an additional console on either side of the main one. These extra two did not quite reproduce the central console in triplicate, but consisted of the Swell, Choir and Solo manuals only, which acted "on separate pallets on the corresponding soundboards" as Hopkins tells us. These extra manuals were designed, he goes on, "to allow of several performers playing on the instrument at the same time, if ever thought desirable."

The last phrase, and the purposely exaggerated word "several", convey most delightfully the sense of distaste with which Hopkins obviously regarded such contraptions. He was, of course, describing it as it stood in the south transept of St.Paul's Cathedral in the sixties, stripped of its pseudo-Byzantine case and sheltering primly behind the old Grinling Gibbons choir-organ-case. Its function in the Panopticon building had been both as a concert-organ and as accompaniment for the performances of magic-lantern slides and dissolving views; hence it is with no surprise that we find descriptions of it, not only in Hopkins and Rimbault but also in an interesting little
1) book on the Cinema-organ written in the nineteen-thirties by the finest of its players.

1. Reginald Foort, "The Cinema Organ."

The earliest church organ to have two consoles seems to have been that in St.George's Hall, Windsor Castle; though it is only half-correct to describe this instrument as being located thus. The organ, in fact, is in two places at once; it stands between the Hall and the adjacent Private Chapel, speaking in both directions; Hill provided duplicate consoles so that the organ could be used in either room. The date is not recorded by Hopkins, but it must have been at any rate prior to 1870, as it is described in the second (1870) edition of his book. It has sometimes been suggested that Willis, in his 1889 rebuild of this organ, was the first to provide it with two consoles: but Hopkins is perfectly clear on the point of Hill's having done so.

<u>The Pedalboard</u>

The pedalboard had hitherto retained its flat, parallel arrangement of keys, though their widths and the distances separating them were not yet standardised. The two exceptions, of radiating pattern, have been mentioned on page 98; and there may have been some others similar to them, but it is significant that no record has remained of what would have been a drastic departure from normal.

As in so many other ways, the 1851 Exhibition was a turning-point in console-matters also. Schulze's small two-manual was fitted with a pedalboard of the concave, parallel shape invented by Edmund Schulze's father and afterwards to become widespread in Germany. There is also a strong possibility that the organ exhibited by Gray and

Davison, afterwards transferred to St.Anne's, Limehouse, may have been similarly fitted. It is described in the last (1877) edition of Hopkins and Rimbault as having a straight and concave pedalboard: no pedalboard at all is specified in the two earlier editions or in the "Illustrated Exhibitor Guide", though the specifications all agree in every other detail; and so, as there is no indication of any alterations to the organ between 1851 and 1877, it may safely be regarded as containing a second instance of the new board at Hyde Park.

Be that as it may, and despite the known fact of its popularity in Germany, the purely concave shape did not at first find many devotees in Britain. Incidentally, it is noteworthy that in France, even to-day, the flat and parallel shape of board retains the greatest following; and the French style of pedalling uses the toes much more, and the heels much less, than the British. Which is cause, and which is effect, it is outside the scope of this work to decide; and it would be even more dangerous to speculate as to which gives the better results ! Certainly, no one can throw any stones at French organ-playing. It was observed with interest that, when a celebrated French woman organist visited Britain for recital tours after the Second World War, she was in the habit of arriving at the organ in ordinary walking-shoes, and changing into the highest of high-heels for playing.

Records as to the actual design of the pedalboard are admitt-

edly sparse; but a reading of Hopkins' remarks in his 1870 edition does not encourage the belief that this type was in general use (i.e. the concave-parallel board): in fact, there is no mention of its hav-
1) ing arrived in England at all. He himself recommends a very sensible design in which the short "black" keys slope slightly upwards, away from the player, while the long "white" keys slope upwards towards the player, from front to back of the board. This practically amounts to a slight concavity at right-angles to the normal direction; and, combined with the modern shape, suggests possibilities of a radiating-spherical pattern which, in all seriousness, might be worth some experiment at least.

Schulze's pedalboard, however, was by no means barren of results. Willis observed it, and called S.S.Wesley's attention to it; and the latter, having no doubt often played on the radiating board at York during his period of office at Leeds Parish Church in the for-
2) ties, remarked "It is a pity he did not go farther, and make his pedals spread out." Thus was born the Wesley-Willis concave radiating pedalboard; and its first appearance seems to have been in the 1854 Winchester Cathedral organ. It was next applied in the St.George's Hall organ in 1855, and thereafter was used by Willis in most of his more important organs.

Other builders adopted it in due course: Nicholson of Worcester at Manchester Cathedral in 1861, Hill in the temporary Nave

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1. Hopkins and Rimbault, p.289
2. Related by Willis in "Musical Times", May 1898.

organ at York Minster in 1863 in 1863, and Wadsworth of Manchester at St.Paul's Wesleyan Chapel, Bedford, in 1869. Nevertheless, the straight, flat board was still to be found in the majority of organs for some years to come.

A suggestion similar to that of Hopkins was made in 1855 by George Cooper — that the back of the naturals should be an inch higher than the front; and the slope of both sharps and naturals was incorporated in the "Audsley-Willis" board. But the radiating-concave pattern began gradually to gain ground, and provided a fair-sized apple of discord in 1881, when some winged words issued from the pen of W.T.Best, à propos of the College of Organists' Conference on organ-construction. Best's views are all the more interesting from his long association with Willis organs and particularly with the new pedalboard. But at the same time it must be remembered that Best and Willis had quarrelled bitterly over the rebuilding of the St.George's Hall instrument in 1867, and Best could never afterwards find a single good word to say for Willis and his work. He was especially critical of Willis' diapasons, and it is related that when Willis was playing on the Albert Hall organ at the request of Best, who had been commissioned to "pass" the organ, he suddenly heard Best's great voice roaring from the floor of the hall, "Your diapasons, I said, Mr. Willis, not your ——— gambas !"

Best, as we shall see below, is equally forthright, though less unprintable, on the subject of pedalboards. His opening paragraph is not quite relevant to our immediate topic, but it is too good to pass over; it is the beginning of a letter to the Editor of a musical periodical:

1) "Sir, — Although I anticipate but little practical result, it is to be hoped that your delegates on the organ-building question, after speculating on the outside timbers of the instrument, will get fairly inside the apology for a case, and creep about that essentially English product — the competitive or churchwarden's organ; an erection which has long excited the admiration of parish undertakers, being set up in a convenient manner for impending dissolution, a fate which sooner or later overtakes it after undergoing frequent doctorings of an expensive kind.

"One of your correspondents (Dr.C.G.Verrinder) appears anxious to enlist my approval, and that of others, in favour of 'concave and radiating' boards, from the fortuitous circumstance that large organs I have played, or still deal with, have been so constructed. 'These facts' — says Dr.Verrinder — 'speak for themselves, and need no comment. Faithfully yours.' As regards myself, I do think they need comment, and at once state that I entirely disapprove of the clumsy apparatus, which makes a pedal-board resemble the bottom of a sailing-boat. A writer in a music-dictionary attempts a silly parallel in comparing the

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1. The "Musical Standard", 1881; quoted in Org.6.52. The date actually falls within the period of Chapter Four, where the reader will find more detailed consideration of the College of Organists' Conference

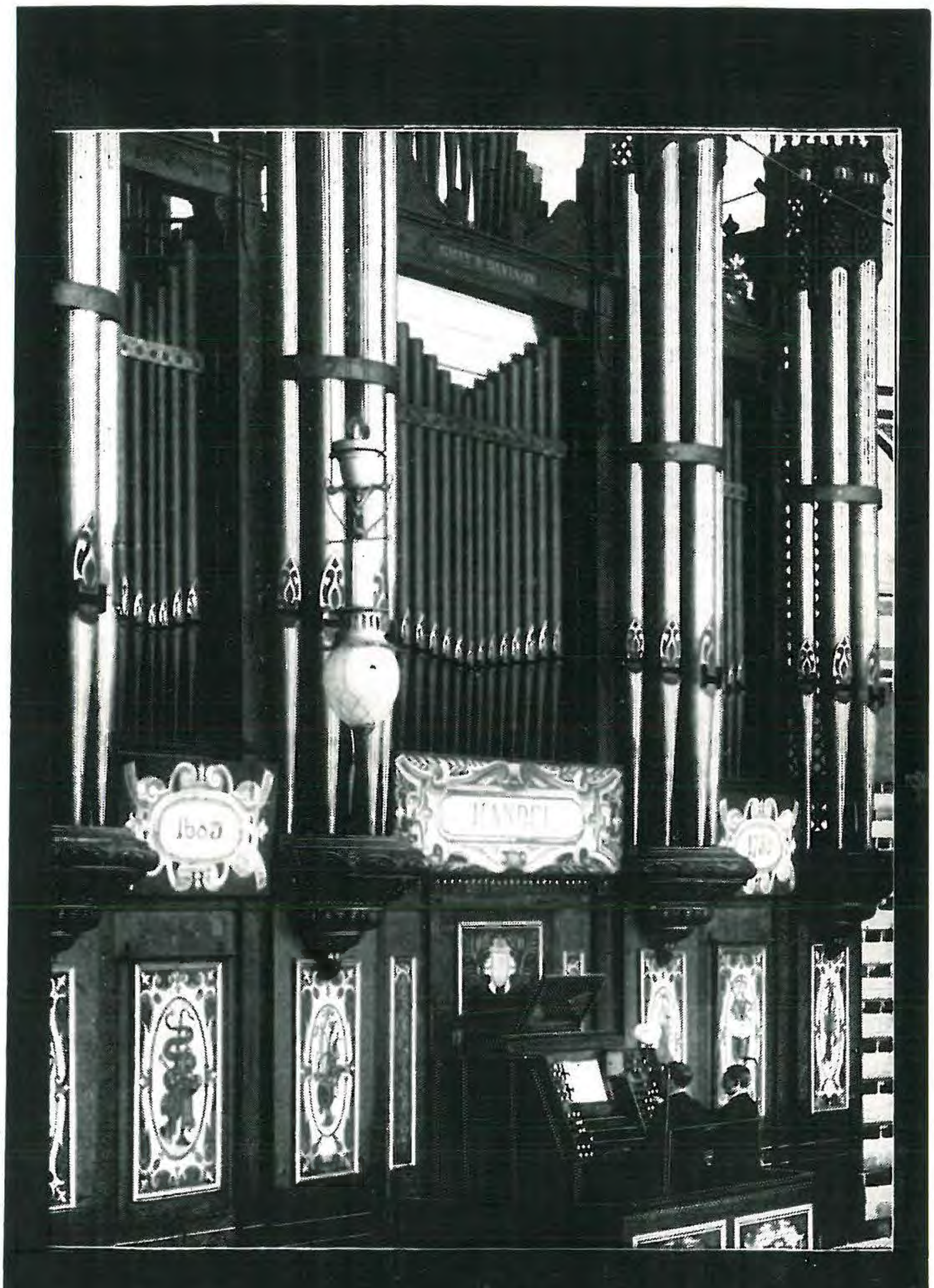
HANDEL

PLATE XI.

The Crystal Palace organ.

Built by Grey and Davison in 1857, this organ was for many years associated with the large-scale Handel festivals which were held at three-yearly intervals in this huge hall; the instrument, indeed, was always known as the Handel Festival organ, and the composer's name and dates are seen to be prominently inscribed on the organ-case. Notice the unusual sloping stop-jambs, with the steps arranged in triple vertical columns on the slightly angled jambs; this was one of the earliest consoles to depart from the square, vertical stop-jambs.

(Photograph by Negretti and Zambra; from "The Story of the Organ" by C.F.Abdy Williams, page 188) oscillation of 'the bob' (!) of a pendulum with the motion of the foot from right to left. Unless a way of playing the organ in a standing position has lately been invented, the simile is not worth the bob he names. In all pedal-playing, the leg is bent from the knee, and then moved backwards and forwards as the passages demand. Under these circumstances, the rise of the foot at each side is a mere nothing: a wiseacre might as aptly supply the keyboard of an eight-octave piano in the form of an arc of a circle, and claim honourable mention from a swimming point of view.

1) "As to the principle of radiation, experience has taught me to hold it in light estimation. Passages which frequently occur , requiring a 'crossing of the feet' on the long keys, are rendered almost impossible, and always hazardous, by the diminishing gauge. Unless the pedals radiate very slightly, which is hardly ever the case, I prefer the usual plan......."

Best's final phrase, "the usual plan", gives a fair indication of the extent to which the older pattern of pedalboard had far from abandoned the field to the newcomer.

More console improvements

The continuous process of evolution and adaption which the organ's tremendous growth forced the console to undergo, was exemplified in the various experiments and innovations, temporary or permanent,

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1. In view of the very definite opinions expressed here by Best, it is curious that Audsley (II.154) should write "The late Mr.W.T.Best ......was a staunch advocate for the adoption of the radiating and concave clavier." In actual fact, Best here supports the flat board !

which originate from this third quarter-century. On the permanent side, two changes may be recorded, both of inestimable value to the player. The first was the "overhanging" of the manuals; on the new four-manual by Kirtland and Jardine in Holy Trinity, Manchester, in 1852, the upper three manuals each projected one inch over the one below, so that the top manual was thus three inches nearer than it would have been under the old "stepped" arrangement. Willis' 1854 console at King's College, London, had a similar overhang; and Gray and Davison followed suit four years later at Leeds Town Hall. No doubt there were other examples in the fifties, but earlier instances are unlikely.

The second important reform was the appearance of combination pistons. In 1851 Willis took out patents both for these and for "adjustable combinations", and incorporated pistons in his large Exhibition organ which subsequently went to Winchester — six pistons each to Great and Swell. Then came King's College, London, with six pistons to the Great only; followed by St.George's Hall a year later. Here, there were six pistons to each of the four manuals, as well as three pistons for the Pedal organ (located below the bass end of the Great manual) and three general pistons below the treble end. These six pistons were repeated below the Choir keys; and there is a strong likelihood that these pistons were all adjustable and could be altored and re-set even while the wind was off. Audsley assures us that they were fixed pistons; but our authority for the opposite viewpoint is Mr. A.Thompson-Allen, a director of the Willis firm, in a letter to the "Musical Times" in September 1950 (p.407). His testimony should certainly be beyond dispute: but it is curious that the adjustable nature of the Liverpool pistons is not referred to (or apparently known by) any other writers, nor did Willis make use of adjustable pistons thereafter until nearly forty years had passed. The material always used by Willis for his pistons was not ivory, but engine-turned brass, which he continued to favour until after the turn of the century.

Other builders began making use of pistons in the later sixties; early instances were St.Giles', Oxford (Harrison, 1867) and the first Bryceson electric instruments. Hopkins perpetrates a curious inaccuracy in this connection: in describing Willis' "composition appliances", he writes

> "No pedals are used, but simply studs or buttons, which project through the beading under the manual keys. Messrs Bryceson sometimes use both the pneumatic buttons and the composition pedals in the same instrument."

Now, there is no foundation whatever for the belief that Willis abandoned composition pedals even temporarily when he adopted thumb-pistons. Winchester Cathedral (1854) had, according to Willis' own specification at the time, "three composition pedals to the pedal

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1. Hopkins and Rimbault, p.99

organ, two of which act upon the Great organ combination movement, producing by one effort a piano or forte on both organs" -- in other words, a forerunner of the "Great to Pedal Combination coupler". St. George's Hall had ten composition pedals, and Clevedon Hall (Somerset) had an unrecorded number of them in 1858, in addition to the six pistons on each of its manuals.

There was still a need for composition pedals, whether or not there were thumb-pistons on the organ: and several improvements were introduced to increase their usefulness. Gray and Davison were awarded a Council Medal at the Exhibition for their invention of "foot
1) pedals duplicating manual couplers". Whether these were "reversible", and which couplers they duplicated, is not mentioned: but in 1858, Bishop and Starr's large organ at Brompton Oratory included reversible pedals acting upon the Swell-to-Great and Great-to-Pedal couplers. In 1861, Nicholson included in his Manchester Cathedral organ two pedals graphically described as "In and out Pedals to Great" and "In and out Pedals to Swell".

Kirtland and Jardine, with their usual alertness, were quick to adopt Gray and Davison's technique, and in 1853 their two-manual at Stockport Sunday School, designed by George Cooper, the assistant-organist of St.Paul's Cathedral, had pedals designated "Pedal, Sub Octave Swell", "Pedal, Unison Octave Swell" (sic), "Pedal, Octave Swell" and "Sforzando Pedal, acting simultaneously upon the Swell

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1. "Illustrated Exhibitor Guide", quoted in Org.22.88

couplers". The exact nature of these controls is made clear by Hop-
1) kins' footnote: "The arrangement of the Pedal Swell Couplers enables the performer to make the various combinations of Great organ with the Swell either by hand with the drawstops, or by the foot". That is to say, the first three pedals duplicated the drawstops "Swell to Great, Suboctave", "Swell to Great, Unison" and "Swell to Great, Octave" respectively, and the "Sforzando" brought on all three of them.

In reading these scattered references, it must be borne in mind that "where there's smoke, there's fire"; it may safely be assumed that there were other organs, though perhaps not very many, which were similarly equipped at about this period. Leeds Town Hall had a system which was positively tortuous in its intended simplicity; Hopkins' enigmatic description is passed on to the reader verbatim:

2) "In order as little as possible to complicate the operations of the performer, there are but four (double action) composition pedals for the whole instrument. These, however, by an instantaneous adjustment act, as the player requires, on the Swell organ alone, or on the Swell, Great and Pedal simultaneously, or on the two latter only. Furthermore, each of these four composition pedals is capable of effecting three different combinations (the changes extending, as before mentioned, to the Swell, Great and Pedal organs, or either of them) the modus operandi, so far as the performer is concerned, being simply the setting of an index, one of

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1. Hopkins and Rimbault, p.511
2. ibid., p.520

which appertains to each of the composition pedals, to the number indicating the required combination.........."

The reader is left to decide for himself whether the "operations of the performer" were really complicated "as little as possible" by this arrangement, whereby the bringing into use of a desired combination involved three movements --- the "instantaneous adjustment" to the required manual of the required pedal, the setting of the index to the required combination, and the pressing of the pedal; not to mention the continuous burden on the memory of remembering which particular combination and manual is attached to each pedal !

Ventils continued to be installed in a number of instruments, sometimes instead of, but more usually in addition to composition pedals. They were invariably to be found in French organs; and in Britain, there were examples in such organs as the Crystal Palace, Leeds Town Hall, Alexandra Palace --- in the words of the specification, "numerous pedals which command the various organs on the French system" --- and the Royal Albert Hall, where the general arrangement of ventils and composition pedals is worth quoting from Willis' original scheme:

> "A double acting vertical movement, struck by the heel of either foot, instantly detaches and connects the movement of the pedal organ from all but the bourdon, violone, open diapason (metal) and octave, and also draws and withdraws the pedal coupler to great organ.............

"Six pedals govern the stops of the pedal organ by means of ventils.

"Two pedals apply and detach a movement that causes the aforesaid six pedals governing the pedal organ to act also upon the combination movement of the great organ.

"Six pedals govern and combine in various ways all the other accessories, and thus, by one instantaneous operation of the performer, vary the effect of the whole instrument at once........

"The sforzando is brought into action by means of a pedal..."

Re-arrangement of the stop-jambs was another of the many problems to be tackled in this period of more and more stops, and various methods were tried. "Receding jambs", that is to say, with the jambs still facing their front but sloping backwards instead of vertical, appeared in Dorps' organ in the Exhibition, and according to one account it was quite an acrobatic feat to manipulate the topmost stops. The Crystal Palace organ also had receding jambs, but these appear from a contemporary photograph to have been slightly "angled", and certainly look as if they were reasonably within reach. It was, in fact, the setting of the stop-jambs at an angle — eventually about 45 degrees — which solved the problem and made a tremendous difference to the organist's comfort: early examples include Clevedon Hall, Somerset (Willis 1858) and York's temporary Nave organ (Hill 1863). In 1854, Willis was still using the old square jambs, at any rate in one of his important organs of that year — King's College, London.

Leeds Town Hall relieved the congestion on its stop-jambs by having the couplers in a separate row above the Solo manual; and during the late sixties and early seventies, there was the beginning of a tendency to reduce the size of the drawstops. They still looked like doorknobs, but at least they were now smallish doorknobs. Hill attempted another solution, for which he was awarded a Council Medal
1) at the Exhibition: "an invention for operating the stop action by means of keys."

2) Swectland's earlier tracker stop-keys have been described; Hill's new patent was a pneumatic-lever one, and was discussed in
3) detail in Pole's booklet at the time. There was a double row of stop-keys, resembling the keys of the manuals themselves, on either side; the keys of one row brought the stops on, those of the other row took them off. The three couplers had ordinary stop-knobs. This organ went to a Yorkshire church (Pitt Street Wesleyan Church, Barnsley) where thirty years later the organist reported that the stopkeys were still working quite well. There is no trace of Hill's having followed this experiment, successful though it seemed, by anything else of the same kind.

Coloured stop-knobs were employed occasionally as an experimental aid to registration. St.Martin-in-the-Fields was briefly men-
4) tioned in Chapter Two, and its console must have presented a gay app-

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1. Org.22.88. Hill's "citation for the medal also referred to his "invention of a new stop of great power". No prizes are offered for guessing its identity.
2. vide supra, p.130
3. William Pole, op.cit.
4. vide supra, p.136n.

cerance with its motley of black, white, red and blue on ivory and mother-of-pearl surfaces. Hill, at Greenwich Naval Hospital in 1862, was more austere, contenting himself with blue and pink only (as well as the normal black and white, one presumes), while at Chelmsford Parish Church — now the Cathedral — in 1873, he used green and red as variants; Hill in fact used coloured stop-knobs in several of his instruments in the sixties and seventies.

In the closing years of this third quarter-century, the first steps were being taken towards another console-modification which had far-reaching results on organ-playing, and on the organ's value as an expressive instrument of music: the balanced swell-pedal. Since the inception of the "Nag's-head Swell", the organist's right foot had been permanently anchored to a projecting lever which opened the swell-shutters — sometimes rather reluctantly — and which kept them open as long as the foot remained there; if the foot happened to slip off its perch, the result was a thunderous crash from within as the shutters slammed home. There was, of course, the ingenious contrivance of the notched rod, which allowed the swell-pedal (in the more up-to-date instruments which possessed it) to be hitched down in one or two intermediate positions.

Such a contraption was all very well in the absence of any pedalboard at all, or in the presence of an octave of pull-downs. The thirty-note board presented organists with a different problem, and the slowness with which they adopted the obvious remedy is one of the less creditable episodes in British organ history. The central balanced, or "French", swell-pedal was known and regularly used in France, as the nickname implies, and was first seen in Britain in the seventies; but even in the early years of the twentieth century, general opinion was still divided as to the relative merits of "hitch-down" or "balanced" pedals.

Cavaillé-Coll's large Sheffield organ (1873) was the first prominent organ to be fitted with these pedals in England, for its Positif (Choir) and Récit (Swell) departments, but yet with the old type of pedal for its Solo. Best now entered the lists as a formidable champion of the balanced swell; it was at his suggestion that Holmes' residence organ at Regent's Park (Bryceson 1875) was fitted with two of them, for the Swell and for the Solo clarinet. Shortly after this, Best expressed himself in print with his usual vigour, in a later part of the same letter from which his views on pedalboards were quoted on pages 265-6. In a list of recommended reforms in organ-design, he includes:

1) "The removal of the swell pedal to a central position, thus rescuing the player's right foot from the gouty eminence where it has long been hanging as an awful example to its rising brother, the left foot, always busy with the very abysses of sound. This alteration, of course, means a conveniently shaped swell

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1. Org.6.54, quoting from the "Musical Standard", 1881.

pedal, poised on an axis, and stationary whenever desired so as to utilise every shade of tone in use at the moment......"

Nevertheless, British conservatism presented a solid obstacle; and, as Chapter Four will show very few organs were provided, before the turn of the century, with what has now come to be accepted as the only form of swell-control compatible with good organ-playing. In 1899, for instance, the "Musical Times" was asked by an organist-correspondent for information as to where he could find an example of this type of pedal, and replied by naming one particular church where it could be seen: clearly, it was still a rarity then.

2) Again, in 1902 a widely-read book by a distinguished organist contained the following, which describes the balanced swell as if it must have been unfamiliar to a great many of his readers:

> "The 'Balance Swell Pedal' (sic) is a contrivance admitting of the Swell shutters being left stationary at any angle. There are many grave drawbacks to this plan. The shutters generally fail to close tightly; indeed, are never properly closed. It is very hard to obtain a 'sforzando' effect. The rocking pedal (balanced pedal) is usually in the centre of the knee board, thus hampering the organist when he endeavours to pedal, using the Swell at the same time. The advantages claimed for the Balance Swell appear to be principally imaginary."

3) Later still, E.H. Lemare wrote in 1910: "It is difficult to

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1. "Musical Times", July 1899.
2. Hinton, "Organ Construction", p.84n
3. "Musical Times", September 1910

believe that even at the present day there is only one English builder who has persistently adopted the balanced Swell-pedal." (Willis was the builder referred to.)

The debate was still vigorously continuing in 1916 and 1917 in the correspondence columns of the "Musical Times", with some readers strongly defending the "hitch-down" pedal even at that date.

Best also lifted up his voice in an attempt to reform the traditional order of manuals in a three- or four-manual organ. Ever since the days when the Choir-organ and its case had been behind the player's back, the Choir manual had been placed below the Great in order to simplify the mechanical connections which passed beneath the floor under the organist's seat. The Swell was the descendant of the old Echo, with its natural location above the Great, both for its pipework and its keys. The French practice was for the Grand Orgue to be the lowest, Positif (Choir) next and Récit (Swell) third. Best advocated this plan in his writings:

1) "In all instruments of three or more keyboards, to place the Great lowest, as it has the most powerful and grand effects of tone. The lighter tones of the swell and choir, being superposed, are more readily available for combined use — as in many pieces of modern organ music — unless 'gilded knobs' for the seduction of the organist's thumbs intervene........."

This was the order adopted in his design for Holmes' organ at Regent's

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1. "Musical Standard", 1881, quoted in Org.6.53-4

Park; but curiously enough, his fine scheme at Bolton, carried out by Gray and Davison in 1874, showed not this but another departure from custom. Choir and Great were kept in their usual position, but the Solo was the third (counting upwards) and the Swell was on top. This was attributed by Audsley to Best's "special taste and style in

> the rendition of orchestral scores on the organ, which so frequently called for the operation of the fingers of one hand on two adjacent keyboards at the same time."

To the end of his life, Audsley advocated the lowest position for the Great, but on insubstantial grounds: ".....the great organ is

> the fundamental tonal division upon which all the other manuals are, or should be, based and built up; accordingly its clavier should occupy the first or lowest position."

The answer to this rather naive argument is simple enough: the Great is the most frequently used keyboard, and should therefore be in the most convenient and comfortable position from the <u>player's</u> point of view, and not according to some audio-visual scheme based on its geographical place in the tonal structure. As the lowest of three or four manuals, it would not fulfil this requirement so satisfactorily as it does in the slightly more elevated place it has always continued to occupy, despite Best's and Audsley's most influential preaching to the contrary.

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1. Audsley, op.cit., II, p.67
2. Audsley, "The Organ of the Twentieth Century",(1922),p.152

1) The _Sforzando pedal_ still remained in vogue as a pedal which brought on the Great-to-Swell coupling as long as it was depressed; Willis even included one at the Albert Hall. But something else was exercising builders, in the field of stop-control: the _Crescendo pedal_, introduced first by Hill into the Panopticon organ —

2) "......a piece of mechanism, worked by a pedal, which drew out all the great organ stops, singly and in succession, producing thereby a gradual and complete crescendo; after doing which, it drew them in again, one by one, producing as complete a diminuendo......"

Willis took out a patent for his own type of Crescendo
3) pedal in 1857. His device worked on the principle of the musical-box or the barrel-organ, and comprised a cylinder with pins tapped into it, operated by two pedals, one for crescendo and the other to reverse the mechanism for diminuendo. One of the first organs to include this mechanism must have been that in Clevedon Hall, Somerset (1858). Leeds Town Hall had crescendo and diminuendo pedals acting on Great and Swell, and Lewis was using a "general crescendo" in the seventies — for example, at St.John's, Wilton Road in 1874.

The beginnings of the nineteenth-century renaissance of
4) the _Tremulant_ were chronicled in Chapter Two; Willis' improvements, patented in 1855, gave final impetus to the increasingly general introduction of it, first and most commonly into the Swell, and in due

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1. vide supra, p.120
2. Hopkins and Rimbault, p.90
3. Org.3.254
4. vide supra, p.125

course into the Choir (in the case of a three-manual where the orchestral solo stops were in this department) or the Solo. One masterpiece of misguided ingenuity must be recorded: at Newark Parish Church in 1866, Father Willis (of all people !) provided the Vox humana on the Solo with a tremulant blown by the player with a rubber tube in his mouth.

The need for <u>mechanical blowing</u> became more imperative as organs grew in size; and during the fifties, two methods made their first appearance — hydraulic and steam, of which the latter made its début first (1853) but the former achieved far more popularity and a
1) longer life. The principle of the wheel and crank gear, invented thirty years earlier by John Smith of Bristol, and which incidentally was still supplied to new organs from time to time (e.g. Selby Abbey, by Brindley and Foster, 1868) was adapted to water-power in 1854. The
2) owner of a small chamber-organ, one Mr. Fernley of Manchester, had attached an eight-foot water-wheel, fitted with eight-inch buckets, to a three-throw crankshaft operating the three feeders of his organ; the wheel was driven by water led through $\frac{3}{4}$inch piping from the cistern of his house.

This simple but effective plan was soon followed by the hydraulic engine developed by David Joy, a Middlesbrough engineer, which was a much more finished product. It too was originally tried out on a chamber-organ; its motive power was not a wheel but a water-driven

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1. vide supra, pp.49-50 and 128
2. "Musical Times", May 1854

reciprocating piston with an adjustable inlet-valve, so that the amount of water consumed could be regulated according to the amount of wind required by the organ. This engine was quickly fitted into several of the biggest Leeds organs — the Town Hall, the Parish Church, and the Brunswick Chapel — during 1858 and 1859. The five engines, (developing eight horse-power !) installed in the Town Hall were found after seven years' use to require no renewal of parts whatsoever, but only cleaning.

London's Temple Church acquired two of them in 1862, and during the first few years after its invention, hydraulic blowing was adopted in such places as King's College (Cambridge), Manchester's Free Trade Hall, and St.Paul's Cathedral.

Hydraulic blowing had the great merit of being ready whenever it was needed, of being literally "on tap". This was not so with the steam engines that were used in some of the very largest instruments. The Panopticon organ (Hill 1853) had six bellows at different pressures worked by steam-power; and St.George's Hall organ was also steam-blown with the rather vexing exception of the high-pressure reeds, which were separately hand-blown by an apparatus placed high up inside the organ close to their soundboard; the drawbacks of this arrangement are obvious.

Willis continued to prefer steam-power for such instruments as the Alexandra Palace and the Albert Hall; and the Bryceson organ

in Holmes' residence was similarly blown. Whenever one of these instruments had to be used, for practice or recitals, advance notice had to be given so that the engineer could get steam up in readiness. However, the use of steam for blowing was not very long-lived. In
1) 1902, Hinton makes no mention of it among the principal methods of blowing, which according to him were hydraulic, gas and electric, with very occasional use of oil-power. Audsley in 1905 mentions hydraulic
2) and electric only.

<u>Tuning and Temperament.</u>

Despite S.S.Wesley's attempt to "stand against the light" in insisting on the retention of unequal tuning at Liverpool in 1855, the era of equal temperament was dawning. Best's opinion, intensified by having to endure playing on the unequally-tempered St.George's Hall organ from then until its conversion in 1867, was summed-up in two explosive sentences:

3) "The less said about the late Dr.Wesley's vagaries in organ-
4) construction, assisted by a convenient coadjutor, the better. He managed to render the English organ-building art ridiculous in the eyes of Europe, and flouted his insane notion of tuning, or rather un-tuning, the instrument in the faces of the great organ composers, who (Bach, Mozart, Mendelssohn and others) in their pieces

1. Hinton, op.cit., p.129
2. Audsley, "Art of Organ-Building", II, 699-701
3. "Musical Standard", 1881, quoted in Org.6.55
4. The "convenient coadjutor" so slightingly arraigned by Best is, also, Willis — after the tragic quarrel which separated the two great men.

in the keys of F minor, A flat major, and other tonalities, maintain very prominent opinions on the subject."

Hill's new Panopticon organ in 1855 was tuned equally, and, in the North of England, Kirtland and Jardine similarly tuned their instrument at Stockport Sunday School, as they did also four years later at the Free Trade Hall, Manchester. Thereafter, the conversions occurred thick and fast, so that by 1870 Hopkins could mention, in a list of "a few of the instruments thus tempered", such organs as

(1) "St. Paul's Cathedral (both organs); Westminster Abbey; St. Sepulchre's, Snow Hill; Temple Church; All Saints', Margaret Street; Foundling Hospital; Crystal Palace (both organs); all the Town Hall organs in the kingdom, etc., etc........."

But Wesley had not given up the struggle; his views in 1870 were thus expressed in a letter to a friend:

(2) "........As to equal tuning — as you speak so clearly about it I will own I do not like it. It is a long story to enter on, so I will only say that I can never enjoy playing on an organ where nothing is in tune, where simple triads produce the effect on the ear which dissolving views do to the eye before the picture has reached full focus. All the organ builders are against it, but have had to yield to fashion, and having once taken the plunge, they are like the fox in the fable and recommend all foxes to give up their tails.........."

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1. Hopkins and Rimbault, p.182
2. Letter dated February 23, 1870; quoted in "Musical Times", October 1902.

One final indication of the length of the struggle may be given: the fact that the Willis organ in Wells Cathedral was still tuned to unequal temperament as late in the century as 1895. Even when the new action was installed in 1891, the opportunity was not taken to make the instrument more aurally bearable. It needed the advent of a new organist, who had not spent seventy years of his life in Wells, to make the change: a young man of whom much more was in due course to be heard, in the world of music — Percy Carter Buck.

It is recorded of Sir George Elvey, organist of St.George's Chapel, Windsor, from 1835 until his retirement in 1882 (he lived on

1) until 1892) that "....during the latter part of his life, Sir George inclined to have equal temperament, but his nervousness prevented him from having this alteration made; for, if he had not after all been satisfied with the result, the older form could not have been returned to."

Possibly there were others, too, who were almost prepared to make the change from what they had been accustomed to all their lives, but who shrank from taking the final and irrevocable plunge. Elvey, of course, was ultra-conservative in organ matters — a GG man to the last, and strongly opposed to the increased range of pedalboard.

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1. Lady Elvey, "Life and Reminiscences of George J. Elvey", (1894), pp.316-7.

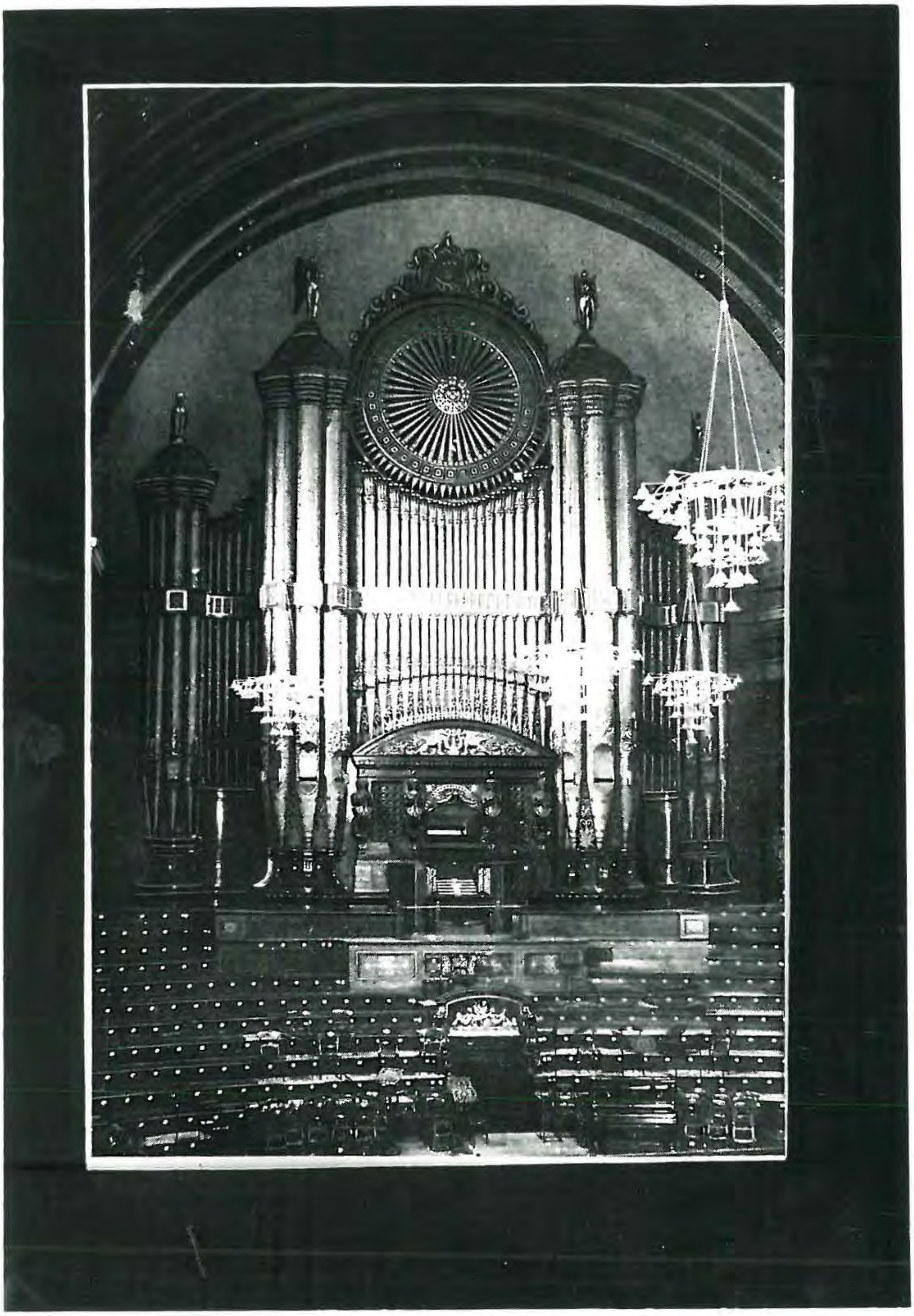

PLATE XII.

Leeds Town Hall.

One of the largest and most progressively-designed concert-organs of the century, this was built by Gray and Davison to the design of Henry Smart and William Spark, and completed in 1858. The large front pipes, of 32-ft size, are fairly successfully managed here, though not every British architect, as Freeman points out, could contrive to deal with them so effectively. The console in this photograph is that of the 1898 rebuild by Abbott and Smith (see Plate XIX).

(Photograph from Org.6.81; blocks lent by Messrs. Abbott and Smith)

SPECIFICATIONS

(to illustrate Chapter Three)

1. EXHIBITION ORGAN — Corpe, 1851

Great (9 stops)

Double diapason	16
Open diapason	8
Stopt diapason	8
Gamba	8
Principal	4
Harmonic flute	4
Mixture	II
Mixture	III
Trumpet	8

Swell (11 stops)

Bourdon	16
Open diapason	8
Stopt diapason	8
Keraulophon	8
Principal	4
Fifteenth	2
Mixture	IV
Hautboy	8
Contra bassoon	16
Cornopean	8
Clarion	4

Choir (7 stops)

Double dulciana	16
Gedackt	8
Spitz flöte	8
Dulcian	8
Voix celeste	8
Flute	4
Clarinet	8

Pedal (6 stops)

Double open diapason	32
Open diapason	16
Bourdon	16
Principal	8
Flute bass	8
Tromba	16

Solo (5 stops)

Clarabella	8
Bell gamba	8
Dulciana	8
Wald flöte	4
Tromba	8

Couplers, etc.

Sw. to Gt.	Sw. to Ped.
Sw. to Ch.	Gt. to Ped.
Ch. to Gt.	Ch. to Ped.
Solo to Gt.	

10 composition pedals.

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2. CITY HALL, GLASGOW — Gray and Davison, 1853

Great (15 stops)

Bourdon	16
Open diapason	8
Stopped diapason	8
Gamba	8
Octave	4
Piccolo	4
Twelfth	3
Fifteenth	2
Ottavina	2
Sesquialtera	III
Mixture	III
Flute harmonique	8
Flute harmonique	4
Posaune	8
Clarion	4

(last four on separate soundboard and higher pressure)

Pedal (6 stops)

Contra bourdon	32
Open diapason	16
Bourdon	16
Octave	8
Fifteenth	4
Trombone	16

(continued overleaf)

(Specifications — Chapter Three — continued)

(Glasgow City Hall: continued)

Swell(16 stops)

Bourdon	16
Open diapason	8
Keraulophon	8
Stopped diapason	8
Clarionet flute	8
Octave	4
Flute	4
Fifteenth	2
Flageolet	2
Sesquialtera	III
Mixture	II
Contra-Fagotto	16
Cornopean	8
Oboe	8
Voix humaine	8
Clarion	4

Choir(10 stops)

Open diapason(tin)	8
Clarionet flute	8
Stopped diapason Bass	8
Salcional	8
Octave	4
Flute	4
Fifteenth	2
Piccolo	2
Corno di bassetto	8
Voix celeste	8

Couplers,etc.

Sw.to Gt.
Sw.to Gt.oct.
Sw.to Gt.suboct.
Ch.to Gt.suboct.
Sw.to Ped.
Gt.to Ped.
Ch.to Ped.
Gt.reeds & Harm.flutes onto Sw.(by pedal)

Compass

Manuals, CC-C, 5 octaves
Pedals, CCC-E, 29 notes.

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3. ROYAL PANOPTICON OF SCIENCE AND ART — Hill, 1853

Great(16 stops)

Double open diapason	16
Open diapason	8
Open diapason No.2	8
Stopped diapason	8
Quint	6
Octave	4
Wald flute	4
Octave quint	3
Super Octave	2
Sesquialtera	III
Mixture	III
Furniture	III
Trumpet	16
Posaune	8
Trumpet	8
Clarion	4

Swell(13 stops)

Bourdon & Double diapason	16
Open diapason	8
Salicional	8
Stopped diapason	8
Octave	4
Octave quint	3
Super Octave	2
Sesquialtera	IV/V
Suabe flute	4
Cornopean	8
Trumpet	8
Hautboy	8
Clarion	4

Choir(12 stops)

Double stopped diapason	16
Gamba	8
Dulciana	8
Stopped diapason	8
Gemshorn	4
Octave quint	3
Super Octave	2
Cymbal	II
Stopped flute	4
Piccolo	2
(Bassoon, bass / Clarionet, treble)	8
Trumpet	8

(continued overleaf)

(Specifications — Chapter Three — continued)

(Panopticon: continued)

Solo(9 stops)		Pedal(10 stops)		Couplers,etc.
Grand tuba mirabilis	8	Double open diapason	32	Su.to Gt.
Grand clarion	4	Open diapason	16	Ch.to Gt.
Claribel	8	Open diapason	16	Solo to Gt.
Harmonic flute	4	Bourdon	16	Ped.to Gt.
Flageolet	2	Octave	8	Ped.to Ch.
Doublette	II	Octave quint	6	Ped.to Sw.
Vox angelica(Ten.C)	8	Super Octave	4	Ped.to Solo
Krum Horn	8	Sesquialtera	V	Two tremulants
Vox humana	8	Trombone	16	9 composition pedals
		Octave trombone	8	
		Drums CC-C		Pneumatic lever attachment

Compass
Manuals, CC-G, 56 notes
Pedals, CCC-E, 29 notes

Crescendo and Diminuendo pedals

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4. WINCHESTER CATHEDRAL — Willis, 1854

Great(13 stops)		Swell(13 stops)		Choir(9 stops)	
Double diapason	16	Double diapason	16	Open diapason	8
Open diapason	8	Open diapason	8	Stopped diapason	8
Open diapason	8	Stopped diapason	8	Dulciana	8
Stopped diapason	8	Flute	4	Principal	4
Principal	4	Principal	4	Flute(open wd)	4
Principal	4	Twelfth	2 2/3	Fifteenth	2
Twelfth	2 2/3	Fifteenth	2	Mixture	III
Fifteenth	2	Sesquialtera	III	Cremona	8
Sesquialtera	III	Mixture	III	Orchestral oboe (ten.C)	8
Mixture	III	Trombone	16		
Trombone	16	Trumpet	8		
Trumpet	8	Hautboy	8		
Clarion	4	Clarion	4		

(continued overleaf)

(Specifications — Chapter Three — continued)

(Winchester Cathedral: continued)

Solo(6 stops)

Double dulciana	16
Viol di gamba	8
Flute harmonique	4
Piccolo	2
Orchestral oboe (mid.C)	8
Corno di bassetto	8

Pedal(8 stops)

Double double diapason	32
Double diapason	16
Violone	16
Octave	8
Superoctave	4
Mixture	III
Trombone	16
Tromba	8

Couplers,etc.

Ch.to Ped.
Gt.to Ped.
Sw.to Ped.
Sw.to Gt.
Ch.to Gt.

Pneumatic-lever to Gt. and part of Sw.

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5. ST.MARTIN-IN-THE-FIELDS — Bevington, 1854

Great(16 stops)

Double diapason (divided ten.C)	16
Open diapason 1	8
Open diapason 2	8
Hohl diapason(ten.C)	8
(Stop diapason (Claribel(ten.C))	8
Principal No.1	4
Quint,double twelfth	6
Decima,tenth	3½
Twelfth	3
Fifteenth	2
Sesquialtera	IV
Furniture	III
Mixture	III
Wald flute(ten.C)	4
Trumpet	8
Clarion	4

Gt.stops: white letters on blue. Swell, white on red. Choir, black on mother-of-pearl. Pedal, red on plain. Couplers, black on plain.

Swell(13 stops)

Bourdon/double diapason	16
Open diapason	8
Dulciana(ten.C)	8
Stop diapason (divided)	8
Flute	4
Principal	4
Twelfth	3
Fifteenth	2
Sesquialtera	IV
Trombone	16
Cornopean	8
Oboe	8
Clarion	4

Couplers,etc

Ped.to Gt.
Ped.to Ch.
Ped.to Sw.
Sw.to Gt.
Sw.to Ch.
9 composition pedals(3 per manual)

Choir(10 stops)

Bourdon/double diapason	16
Open diapason	8
Viol de Gamba(ten.C)	8
Dulciana(ten.C)	8
Claribel/ Stop diapason	8
Principal	4
Flute	4
Dulciana mixture	III
Clarionet(ten.C)	8
Bassoon(ten.C)	16

Pedal(9 stops)

Great open diapason	16
Bourdon	16
Unison open diapason	16
Unison stop diapason	16
Principal	8
Great trombone	16
Trumpet	8
Quint & decima	II
Twelfth & fifteenth	II

(Specifications — Chapter Three — continued)

6. ST.GEORGE'S HALL, LIVERPOOL — Willis, 1855

Great(25 stops)

Dble.open diapason	16
Open diapason	8
Open diapason	8
Clarabella	8
Flûte à pavillon	8
Lieblich gedact	8
Violoncello	8
Quint	6
Octave viola	4
Principal	4
Principal	4
Flauto traverso	4
Decima	3
Twelfth	3
Fifteenth	2
Fifteenth	2
Doublette	II
Sesquialtera	V
Mixture	IV
Contra trombone	16
Trombone	8
Ophicleide	8
Trumpet	8
Clarion	4
Clarion	4

Swell(25 stops)

Double diapason	16
Open diapason	8
Open diapason	8
Echo dulciana	8
Lieblich gedact	8
Voix celeste	8
Principal	4
Gemshorn	4
Wald flute	4
Twelfth	3
Fifteenth	2
Fifteenth	2
Piccolo	2
Doublette	II
Sesquialtera	V
Contra trombone	16
Contra fagotto	16
Ophicleide	8
Trumpet	8
Corno dolce	8
Oboe	8
Corno di bassetto	8
Vox humana	8
Clarion	4
Clarion	4

Choir(18 stops)

Bourdon	16
Open diapason	8
Clarabella	8
Lieblich gedact	8
Dulciana	8
Viol di gamba	8
Voix celeste	8
Principal	4
Harmonic flute	4
Octave viola	4
Twelfth	3
Fifteenth	2
Flageolet	2
Sesquialtera	IV
Tromba	8
Clarionet	8
Orchestral oboe	8
Clarion	4

Solo(15 stops)

Bourdon	16
Flauto dolce	8
Lieblich gedact	8
Flute harmonique	4
Piccolo harmonique	2
Contra fagotto	16
Trombone	8
Bassoon	8
Clarionet	8
Orchestral oboe	8
Clarion	4
Tromba	8
Ophicleide	8
Cornopean	8
Trompette harmonique	8

Pedal(17 stops)

Dble.open diapason	32
Dble.open diapason	32
Open diapason	16
Open diapason	16
Violone	16
Bourdon	16
Principal	8
Flute	8
Quint	6
Fifteenth	4
Fourniture	V
Mixture	IV
Contra trombone	32
Trombone	16
Ophicleide	16
Trompette	8
Clarion	4

Couplers: Sw.to Gt. Ch.to Gt. Solo to Gt. Solo to Ch. Gt.to Ped.
Sw.to Ped. Ch.to Ped. Solo to Ped. Sw.to Gt.suboct.
Sw.to Gt.superoct. Tremulant to Sw. 10 composition pedals.
6 pistons to each manual. 3 pistons to Pedals & 3 general.
Pneumatic-lever action. Steam-blown (heavy reeds hand-blown)

(Specifications — Chapter Three— continued)

7. ST.PETER'S CHURCH, MANCHESTER — Kirtland and Jardine, 1856

Great(17 stops)

Dble.open diapason	16
Grand open diapason	8
Open diapason	8
Gamba	8
Flûte à pavilon(sic)	8
Stopped diapason	8
Quint	5 1/3
Grand principal	4
Principal	4
Clear flute	4
Twelfth	2 2/3
Fifteenth	2
Full mixture	V
Sharp mixture	IV
Double trumpet	16
Trompette harmonique	8
Clarion	4

Swell(14 stops)

Bourdon	16
Open diapason	8
Hohl flöte	8
Stopped diapason	8
Principal	4
Gedackt flute	4
Twelfth	2 2/3
Fifteenth	2
Clear mixture	V
Contra fagotto	16
Cornopean	8
Hautboy	8
Cor anglais	8
Clarion	4

Choir(14 stops)

Bourdon	16
Spitzflöte	8
Dulciana	8
Viola da gamba	8
Gedackt	8
Voix celestes	8
Gemshorn	4
Flauto traverso (harmonic)	4
Rohr flöte	4
Fifteenth	2
Mixture	IV
Euphone/Bassoon	16
Trumpet	8
Voix humaine	8

Solo(5 stops)

Open diapason(harmonic)	8
Concert flute(harmonic)	4
Flageolet(harmonic)	2
Tromba	8
Corno di bassetto & Clarionet	8

Pedal(11 stops)

Sub bass	32
Open diapason	16
Violon	16
Stopped diapason	16
Grosse quint	10 2/3
Principal	8
Violoncello	8
Twelfth	5 1/3
Fifteenth	4
Posaune	16
Trumpet	8

Couplers

Solo to Gt.
Sw.to Gt.
Sw.to Gt.oct.
Sw.to Gt.suboct.
Ch.to Gt.
Solo to Ped.
Sw.to Ped.
Gt.to Ped.
Ch.to Gt.
Tremulant to Sw.
Tremulant to Ch.
Sforzando pedal
Pedal organ attachment

Compass

Manuals; CC-G, 56 notes
Pedals; CCC-F, 30 notes

8 composition pedals (4 Gt., 2 Ped., 2 Sw.)

(Specifications — Chapter Three — continued)

8. CRYSTAL PALACE — Gray and Davison, 1857

Great(19 stops)

Dble.open diapason	16
Double dulciana	16
Open diapason	8
Flute à pavillon	8
Claribel flute	8
Flute harmonique	8
Quint	6
Flute octaviante	4
Twelfth	3
Superoctave	2
Flageolet harmonique	2
Mixture	IV
Furniture	III
Cymbal	V
Contra trombone	16
Posaune	8
Trumpet harmonique	8
Clarion	4
Octave clarion	2

Swell(17 stops)

Bourdon	16
Open diapason	8
Keraulophon	8
Concert flute	8
Octave	4
Flute octaviante	4
Twelfth	3
Superoctave	2
Mixture	IV
Furniture	III
Piccolo harmonique	2
Vox humana	8
Contra fagotto	16
Cornopean	8
Oboe	8
Echo tromba	8
Clarion	4

Choir(12 stops)

Bourdon	16
Gamba	8
Salicional	8
Voix celeste	8
Clarinet flute	8
Gemshorn	4
Claribel flute	4
Spitz flute	2
Piccolo	2
Mixture	III
Cor anglais/ Bassoon	8
Trumpet	8

Solo(5 stops)

Flute harmonique	8
Flute octaviante	4
Mixture	II
Corno di bassetto	8
Grand tromba	8

Pedal(12 stops)

Contra bass	32
Open diapason	16
Open diapason	16
Violone	16
Octave	8
Twelfth	5 1/3
Superoctave	4
Mixture	IV
Contra bombarde	32
Bombardo	16
Trumpet	8
Clarion	4

Couplers,etc.

Sw.to Gt.
Sw.oct.
Sw.suboct.
Sw.to Ch.
Ch.to Gt.
Ch.oct.
Solo to Gt.
Ch.to Ped.
Gt.to Ped.
Sw.to Ped.
Solo to Ped.
Tremulant.

Compass:

Manuals,	CC-A,	58 notes
Pedals,	CCC-F,	30 notes

(Specifications — Chapter Three — continued)

9. FREE TRADE HALL, MANCHESTER — Kirtland and Jardine, 1857

Great(15 stops)

Dble.open diapason	16
Open diapason	8
Violin diapason	8
Hohl flöte	8
Open diapason	8
Quint	5 1/3
Principal	4
Gamba	4
Clear flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	V
Double trumpet	16
Posaune	8
Clarion	4

Swell(19 stops)

Bourdon	16
Open diapason	8
Salcional	8
Stopped diapason	8
Dulciana	8
Voix celeste	8
Quint	5 1/3
Principal	4
Hohl flöte	4
Rohr flöte	4
Twelfth	2 2/3
Fifteenth	2
Mixture	V
Euphone	16
Oboe	8
Voix humaine	8
Cornopean	8
Clarion	4
Octave clarion	2

Solo(8 stops)

Hohl flöte	8
Gamba	8
Corno dolce	8
Flute harmonique	4
Bassoon/Clarinet	8
Tuba	8
Harmonica	4
Tuba	4

Pedal(10 stops)

Sub-bass	32
Open diapason	16
Bourdon	16
Quint	10 2/3
Principal	8
Violoncello	8
Twelfth	5 1/3
Fifteenth	4
Posaune	16
Trumpet	8

Couplers,etc.

Sw.to Gt.
Solo to Gt.
Sw.to Ped. Solo to Ped.
Sw.to Gt.oct. Gt.to Ped.
Sw.tremulant. 8 composition pedals
Glockette. (4 Gt., 2 Sw., 2 Ped.)
Hydraulic blowing. Equal temperament.

Compass: Manuals, CC–G
Pedals, CCC–E

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10. WELLS CATHEDRAL — Willis, 1857

Great(13 stops)

Double diapason	16
Open diapason	8
Open diapason	8
Stopped diapason	8
Principal	4
Principal	4
Twelfth	2 2/3
Fifteenth	2
Sesquialtera	III
Mixture	III
Trombone	16
Posaune	8
Clarion	4

Swell(10 stops)

Double diapason	16
Open diapason	8
Stopped diapason	8
Principal	4
Fifteenth	2
Echo cornet	III
Contra fagotto	16
Trumpet	8
Hautboy	8
Clarion	4

Choir(9 stops)

Double diapason	16
Open diapason	8
Dulciana	8
Stopped diapason	8
Principal	4
Flute harmonique	4
Piccolo harmonique	2
Clarinet	8
Orchestral oboe (mid.C)	8

(continued overleaf)

(Specifications –– Chapter Three –– continued)

(Wells Cathedral: continued)

<u>Pedal(8 stops)</u>

Double diapason	16
Metal violone	16
Bourdon	16
Principal	8
Fifteenth	4
Mixture	III
Trombone	16
Posaune	8

<u>Couplers</u>

Sw.to Gt.
Ch.to Ped.
Sw.to Ch.
Gt.to Ped.
Sw.to Ped.
Ch.to Gt.

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11. <u>BROMPTON ORATORY</u> –– Bishop and Starr, 1858

<u>Great(15 stops)</u>

Sub open diapason	16
Open diapason	8
Bell diapason	8
Clarabella	8
Harmonic flute	8
Stopped diapason	8
Principal	4
Wald flute	4
Twelfth	2 2/3
Fifteenth	2
Block flute	2
Sesquialtera	IV
Mixture	III
Posaune	8
Clarion	4

<u>Pedal(11 stops)</u>

Open diapason	16
Open diapason	16
Violone	16
Bourdon	16
Principal	8
Stopped flute	8
Fifteenth	4
Sesquialtera	III
Mixture	II
Bombardon	16
Clarion	8

<u>Swell(15 stops)</u>

Double diapason	16
Open diapason	8
Salicional	8
Kornulophon	8
Clarionet flute	8
Principal	4
Fifteenth	2
Sesquialtera	III
Mixture	III
Contra fagotto	16
Cornopean	8
Hautboy	8
Clarion	4

<u>Solo(2 stops)</u>

Flute harmonique	8
Tuba	8

<u>Couplers,etc.</u>

Unison couplers, also Pedal Octave (with extra octave of pipes).
<u>11 composition pedals</u>
(4 Gt.,3 Sw.,3 Ch.,1 Ped.)

<u>Reversibles:</u> Sw.to Gt.
Gt.to Ped.

<u>Choir(13 stops)</u>

Bourdon, bass / Sub dulciana, treble	16
Stopped bass / Metallic flute	8
Dulciana	8
Open diapason(ten.C)	8
Viol di gamba(ten.C)	8
Principal	4
Flauto traverso (ten.C)	4
Hohl flute	4
Fifteenth	2
Piccolo	2
Dulciana mixture	III
Bassoon bass / Bassoon treble	8
Cremona(ten.C)	8

<u>Wind pressures</u>

Gt. & Ch.	3"
Sw.	2½" & 3½"
Solo.	6"
Ped.	3½" & 5"

<u>Compass</u>

Manuals, CC–A
Pedals, CCC–E

(Specifications — Chapter Three — continued)

12. LEEDS TOWN HALL — Gray and Davison, 1858-9

Great(26 stops)

"Front Great"

Double diapason	16
Open diapason	8
Spitz gambia	8
Stopped diapason	8
Octave	4
Wald flöte	4
Twelfth	3
Fifteenth	2
Quint mixture	IV
Tierce mixture	V
Trumpet	8
Clarion	4

"Back Great"

Bourdon	16
Flute à Pavilion	8
Viola	8
Flute harmonic	8
Quint	6
Octave	4
Flute octaviante	4
Piccolo harmonic	2
Cymbal	III
Furniture	IV
Contra trombone	16
Trombone	8
Trumpet harmonic	8
Tenor trombone	4

Echo(6 stops)
(played on Solo or Choir)

Bourdon	16
Dulciana	8
Lieblich gedackt	8
Flauto traverso	4
Flute d'amour	4
Dulciana mixture	IV

Swell(19 stops)

Bourdon	16
Open diapason	8
Stopped diapason (divided)	8
Keraulophon(ten.C)	8
Harmonic flute (ten.C)	8
Octave	4
Gemshorn	4
Wood flute	4
Twelfth	3
Fifteenth	2
Piccolo	2
Sesquialtera	IV
Mixture	III
Contra fagotto	16
Trumpet	8
Cornopean	8
Oboe	8
Vox humana	8
Clarion	4

Orchestral Solo (9 stops)

Bourdon	16
Concert flute harmonic	8
Piccolo harmonic	4
Ottavina harmonic	2
Clarinet	8
Oboe	8
Cor anglais & bassoon	8
Tromba	8
Ophicleide	8

Choir(15 stops)

Sub dulciana	16
Open diapason	8
Rohr flute	8
Salcional	8
Viol di gamba(ten.C)	8
Octave	4
Suabe flute	4
Flute harmonic	4
Twelfth	3
Fifteenth	2
Ottavina	2
Dulciana mixture	V
Euphone(free reed)	16
Trumpet	8
Clarion	4

Pedal(16 stops)

Sub bass(open metal)	32
Contra bourdon	32
Open diapason	16
Open diapason	16
Violon	16
Bourdon	16
Quint	12
Octave	8
Violoncello	8
Twelfth	6
Fifteenth	4
Mixture	V
Contra bombard (free reed)	32
Bombard	16
Fagotto	16
Clarion	8

(continued overleaf)

(Specifications — Chapter Three — continued)

(Leeds Town Hall: continued)

Mechanical Combination stops (Solo organ)	Couplers, etc.	
Clarinet and flute, in octaves	Solo to Gt.	Solo to Ped.
Oboe and flute, in octaves	Gt. to Solo	Echo to Solo
Clarinet and bassoon, in octaves	Solo superoct.	Echo to Ch.
Clarinet and oboe, in octaves	Solo suboct.	Sw. to Ped.
Oboe and Bassoon, in octaves	Sw. to Gt. superoct.	Ch. to Ped.
Flute, Clarinet and Bassoon, in double octaves	Sw. to Gt. unison	Gt. to Ped.
Flute, Oboe and Bassoon, in double octaves	Sw. to Gt. suboct.	Full ped.
	Sw. to Ch.	Tremulant to Echo
	Ch. to Gt.	

Pedals, etc., for mechanical adjustment

1. Swell pedal
2. Swell pedal for Solo organ
3. Swell tremulant pedal
4. Pedal admitting wind to Back Great organ
5. Pedal coupling Back Great organ to Swell clavier

6, 7, 8, 9. Composition pedals
10. Crescendo pedal
11. Diminuendo pedal
12 to 15. Indexes to Composition pedals
16 and 17. Wind couplers to Composition pedals

Pneumatic-lever action.   5 hydraulic engines for blowing.

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15. LEEDS PARISH CHURCH — Hill and Schulze, 1859

Great (15 stops)	
Dble. open diapason	16
Bourdon	16
Open diapason	8
Open diapason	8
Stopped diapason	8
Harmonic flute	4
Octave	4
Twelfth	2 2/3
Fifteenth	2
Sesquialtera	III
Full mixture	V
Double trumpet	16
Trumpet	8
Trombone	8
Clarion	4

Choir (10 stops)	
Bourdon	16
Open diapason	8
Dulciana	8
Traverse flute	8
Open bass	8
Gedacht	8
Gemshorn	4
Gedacht	4
Octave gamba	4
Clarionet	8

Pedal (9 stops)	
Major bass	32
Open bass	16
Violon bass	16
Bourdon	16
Octave	8
Flute	8
Contra posaune	32
Posaune	16
Clarion	8

(continued overleaf)

(Specifications — Chapter Three — continued)

(Leeds Parish Church: continued)

<u>Swell(17 stops)</u>

Dble.open diapason	16
Open diapason	8
Keraulophon	8
Cone gamba	8
Salicional	8
Stopped diapason	8
Octave	4
Waldflute	4
Twelfth	2 2/3
Fifteenth	2
Piccolo	2
Full mixture	III
Contra fagotto	16
Horn	8
Trumpet	8
Oboe	8
Clarion	4

<u>Solo(12 stops)</u>

Lieblich bourdon	16
Open diapason	8
Viola da gamba	8
Dolce	8
Lieblich gedackt	8
Flauto traverso	8
Flauto dolce	4
Octave	4
Lieblich flute	4
Mixture	III
Salicet	8
Terpodion	8

Hydraulic blowing

<u>Couplers</u>

Solo to Gt.
Su.to Ch.
Su.to Gt.
Su.to Ped.
Gt.to Ped.
Ch.to Ped.

The Swell is entirely by Hill; Schulze made the complete "Solo" (on 1½-inch wind) and re-voiced Choir and Great, adding a large Open diapason to the latter.

<u>14. LICHFIELD CATHEDRAL</u> — Holdich, 1860

<u>Great(17 stops)</u>

Sub bass/Tenoroon	16
Open diapason	8
Open diapason (divided)	8
Bell gamba	8
Claribella	8
Stopped diapason	8
Octave	4
Gamba octave	4
Wald flute	4
Super quint	3
Super octave	2
Tierce	1 3/5
Sesquialtera	II
Doublette	II
Mixture	II
Posaune	8
Clarion	4

<u>Swell(14 stops)</u>

Bourdon/Dble. diapason	16
Open diapason (divided)	8
Stopped diapason	8
Keraulophon	8
Principal	4
Fifteenth	2
Tierce	1 3/5
Sesquialtera	II
Mixture	II
Cornopean(divided)	8
Trumpet	8
Hautboy(ten.C)	8
Tromba(ten.C)	16
Clarion	4

<u>Pedal(10 stops)</u>

Dble.dble.open diapason	32
Dble.open diapason	16
Montre	16
Grand bourdon	16
Octave	8
Super octave	4
Sesquialtera	II
Mixture	II
Grand trombone	16
Grand trumpet	8

(continued overleaf)

(Specifications — Chapter Three — continued)

(Lichfield Cathedral: continued)

Choir(6 stops)		Couplers, etc.	
Dulciana	8	Ped.to Gt.	8 composition pedals
Stopped diapason (divided)	8	Ped.to Sw.	
Principal	4	Ped.to Ch.	Pneumatic-lever to Great and Pedal
Flute	4	Sw.to Gt.	
Fifteenth	2	Gt.to Ch.	
Cremona	8	Sw.to Ch.	
		Ped.oct.	

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15. WALLASEY PARISH CHURCH — Willis, 1861

Great(13 stops)		Swell(9 stops)		Pedal(4 stops)	
Double diapason	16	Stopped diapason	8	Open diapason	16
Stopped diapason	8	Open diapason	8	Bourdon	16
Dulciana	8	Harmonic flute	4	Trombone	16
Gamba	8	Principal	4	Bassoon	8
Open diapason	8	Mixture	III		
Harmonic flute	4	Contra fagotto	16		
Principal	4	Trumpet	8	Couplers, etc.	
Twelfth	2 2/3	Oboe	8		
Fifteenth	2	Vox humana	8	Gt.to Ped.	
Mixture	IV			Sw.to Ped.	
Trumpet	8			Sw.to Gt.	
Clarion	4			Sw.oct.	
Clarinet	8			Sw.tremulant	

Tracker action.

Reversed console. Light wind.

This organ was designed by W.T. Best, who was organist of the church at the time.

(Specifications — Chapter Three — continued)

16. DONCASTER PARISH CHURCH — Schulze, 1862

Great(20 stops)

Sub-bourdon(ten.C)	32
Dble.open diapason	16
Bourdon	16
Open diapason	8
Octave	8
Hohl flöte	8
Stop diapason	8
Great quinte	5 1/3
Principal	4
Gemshorn	4
Stopt flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	V
Cimbal	III/V
Cornet(ten.C)	IV
Double trumpet	16
Trumpet	8
Posaune	8
Clarion	4

Solo(9 stops)
(mostly from Sw.)

Gemshorn	8
Harmonic flute	8
Rohr flöte	8
Harmonic flute	4
Stopt flute	4
Double bassoon	16
Hautboy	8
Horn	8
Vox humana	8

Swell(18 stops)

Bourdon	16
Open diapason	8
Gemshorn	8
Terpodion	8
Harmonic flute	8
Rohr flöte	8
Principal	4
Harmonic flute	4
Stopt flute	4
Viol d'amour	4
Mixture	V
Scharf	III
Cornet(ten.C)	IV
Double bassoon	16
Hautboy	8
Trumpet	8
Horn	8
Clarion	4

Choir(13 stops)

Lieblich gedact	16
Geigen principal	8
Viol de gamba	8
Flauto traverso	8
Salicional	8
Lieblich gedact	8
Geigen principal	4
Lieblich flöte	4
Flauto traverso	4
Quintatön	4
Flautino	2
Flauto gambo	8
Clarinet	8

Pedal(25 stops)

Sub principal	32
Major bass	16
Principal bass	16
Sub-bass	16
Open diapason bass	16
Violon	16
Minor bass	8
Octave bass	8
Violoncello	8
Flute bass	8
Great quint	10 2/3
Quint bass	5 1/3
Great tierce	6 2/3
Fifteenth bass	4
Tierce	3 1/5
Mixture	II
Cymbal	II
Contra posaune	32
Posaune	16
Bombard	16
Contra fagotto	16
Trumpet	8
Horn	8
Fagotto	8
Clarion	4

Echo(8 stops)

Tibia major	16
Vox angelica	8
Harmonica	8
Flauto traverso	8
Flauto amabile	8
Celestina	4
Flauto dolcissimo	4
Harmonica aetheria	II

Couplers, etc.

Gt.to Ped.)
Sw.to Ped.) by
Ch.to Ped.) pedal
Trem.Sw.)

Thunder pedal
2 Combination stops for Gt.
2 Combination stops for Sw.
1 combination for Ped.

1 combination for Ch.
Pneumatic-lever for Gt. & Sw.
(remainder tracker)

Hand-blown (treadmill apparatus)

(Specifications — Chapter Three — continued)

17. TEMPLE CHURCH — Robson, 1862

Great(16 stops)		Swell(12 stops)		Choir(11 stops)	
Double diapason	16	Bourdon	16	#Lieblich bordun	16
Open diapason	8	Open diapason	8	Spitz-flöte	8
Open diapason	8	Rohr gedact	8	#Violin diapason	8
Stopped diapason	8	Principal	4	Dulciana	8
#Hohl flöte	8	Rohr flöte	4	#Lieblich gedact	8
Viola da gamba	8	Twelfth/Fifteenth	II	#Flauto traverso	8
Principal	4	Mixture	IV	Gemshorn	4
Octave	4	Double bassoon	16	Violino	4
Wald flute	4	French horn	8	#Lieblich flöte	4
Twelfth	2 2/3	Hautboy	8	#Nazard/Flautino	II
Fifteenth	2	Clarion	4	Corno di bassetto	8
Full mixture	III	Voix humaine	8		
Sharp mixture	V				
Smalltrumpet	8				
Large trumpet	8				
Clarion	4				

Couplers,etc.

Sw.to Gt.
Ch.suboct.to Gt.
Sw.to Ch.
Gt.to Ped.
Sw.to Ped.
Ch.to Ped.
Soft pedal organ
Tremulant

Pedal(8 stops)

Sub-bass	32
Open bass	16
Stopped bass	16
#Violon	16
Quint	10 2/3
#Violoncello	8
Twelfth/Fifteenth	II
Trombone	16

5 composition pedals to Gt.& Ped.
5 composition pedals to Sw.
Pedals for Sw.to Gt. and Gt.to Ped.

Two hydraulic engines

(Stops marked # were supplied by Schulze)

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18. YORK MINSTER — Hill, 1863

Great(24 stops)

Dble.open diapason	16	Octave	8	Sharp mixture	III
Bourdon	16	Octave	4	Tierce mixture	III
Open diapason,east	8	Gemshorn	4	Cornet	IV
Open diapason,west	8	Harmonic flute	4	Glockenspiel	II
Open diapason,No.3	8	Twelfth	2 2/3	Double trumpet	16
Gamba	8	Fifteenth	2	Posaune	8
Stopped diapason	8	Octave flute	2	Trumpet	8
Quint	5 1/3	Full mixture	IV	Clarion	4

(Specifications — Chapter Three — continued)

(York Minster: continued)

<u>Swell(14 stops)</u>

Bourdon	16
Open diapason	8
Dulciana	8
Stopped diapason	8
Octave	4
Fifteenth	2
Full mixture	III
Dulciana mixture	III
Double bassoon	16
Horn	8
Trumpet	8
Oboe	8
Vox humana	8
Clarion	4

<u>Choir(9 stops)</u>

Gedact	16
Open diapason	8
Dulciana	8
Stopped diapason	8
Octave	4
Wald flute	4
Fifteenth	2
Mixture	II
Clarinet	8

<u>Solo(3 stops)</u>

Double tuba	16
Tuba	8
Harmonic flute	4

<u>Pedal(19 stops)</u>

Dble.open diapason	32
Dble.open diapason	32
Open diapason	16
Open diapason	16
Sub-bass	16
Violone	16
Bourdon	16
Quint	10 2/3
Octave	8
Octave bass	8
Flute bass	8
Twelfth	5 1/3
Fifteenth	4
Mixture	V
Sackbut	32
Trombone	16
Bassoon	16
Clarion	8
Octave clarion	4

<u>Couplers,etc.</u>

	Sw.to Ch.
Solo to Sw.	Sw.to Ped.
Solo to Gt.	Gt.to Ped.
Sw.to Gt.	Ch.to Ped.

8 composition pedals(2 Ped., 2 Sw., 4 Gt.) 2 tremulants.

Gt., Sw. and Ped. pneumatic.

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<u>19. THE QUEEN'S COLLEGE, OXFORD</u> — Walker, 1866

<u>Great(19 stops)</u>

Contra bourdon	32
(Dble.open diapason) / (Tenoroon diapason)	16
Open diapason	8
Open diapason	8
Stopped diapason	8
Gamba	8
Principal	4
Gemshorn	4
Harmonic flute	4
Twelfth	2,2/3
Fifteenth	2
Flageolet	2
Full mixture	
Sharp mixture	
(Double trumpet) / (Tenoroon trumpet)	16
Posaune	8
Trumpet	8
Clarion	4

<u>Choir(8 stops)</u>

Gedact/Lieblich gedact	8
Salicet	8
Spitzflöte	8
Principal	4
Lieblich flute	4
Flauto traverso	4
Flageolet	2
Cymbal	II

(continued overleaf)

(Specifications — Chapter Three — continued)

(Queen's College, Oxford: continued)

Swell(18 stops)

Bourdon/Dble. diapason	16
Open diapason	8
Salicional	8
Keraulophon	8
Stopped diapason	8
Principal	4
Gemshorn	4
Stopped flute	4
Piccolo harmonique	2
Full mixture	
Sharp mixture	
Echo cornet	
Campana	$\frac{1}{2}$
Trombone/Dble. trumpet	16
Horn	8
Trumpet	8
Oboe	8
Clarion	4

Solo(10 stops)

Flute harmonique	8
Flute harmonique	4
Contra fagotto	16
Euphone	16
Orchestral oboe & bassoon	8
Clarinet/Cromorne	8
Cor anglais	8
Vox humana	8
Tuba mirabilis	8
Tuba clarion	4

Pedal(10 stops)

Dble.open diapason	32
Open diapason	16
Violone	16
Bourdon	16
Principal	8
Stopped flute	8
Violoncello	8
Full mixture	
Posaune	16
Trumpet	8

10 couplers.

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20. ST.BARTHOLOMEW'S CHURCH, ARMLEY, LEEDS — Schulze, 1869

Great(12 stops)

Sub principal	16
Bordun	16
Major principal	8
Gemshorn	8
Hohl flöte	8
Gedact	8
Octave	4
Hohl flöte	4
Rausch-quinte	II
Mixture	V
Tuba	16
Trompete	8

Swell(12 stops)

Bordun	16
Geigen principal	8
Gamba	8
Rohr flöte	8
Flauto traverso	8
Salicional	8
Octave	4
Flauto traverso	4
Cymbel	IV
Oboe	8
Horn	8
Clarine	4

Choir(11 stops)

Lieblich bordun	16
Minor principal	8
Cello/violine	8
Harmonica	8
Orchester flöte	8
Lieblich gedact	8
Octave	4
Lieblich flöte	4
Piccolo	2
Cornett	II-V
Clarinette	8

(continued overleaf)

(Specifications — Chapter Three — continued)

(St.Bartholomew's, Armley: continued)

Echo(10 stops)		Pedal(12 stops)		Wind-pressures	
Tibia major	16	Sub-bass(open wd)	32		
Still gedact	8	Principal bass(wd)	16	Gt.	3½" and 4"
Dolcan	8	Open metal	16	Sw.	3½"
Zart flöte	8	Sub-bass	16	Ch.	2½"
Vox angelica	8	Violone(wd)	16	Echo	1½"
Echo oboe	8	Quinte	10 2/3	Pedal	3½" and 4"
Echo flöte	4	Violoncello	8		
Dolcissimo	4	Octave	8		
Nasard	2 2/3	Flöten bass	8		
Flautino	2	Octave	4		
		Posaune	16		
		Trompete	8		

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21. ALEXANDRA PALACE, LONDON — Willis, 1868 (repeated 1875)

Great(20 stops)		Swell(21 stops)		Choir(17 stops)	
Double diapason	16	Double diapason	16	Contra gamba	16
Bourdon	16	Bourdon	16	Viol di gamba	8
Open diapason	8	Open diapason	8	Salicional	8
Open diapason	8	Open diapason	8	Claribel	8
Open diapason	8	Salicional	8	Flute harmonique	8
Viol di gamba	8	Lieblich gedact	8	Lieblich gedact	8
Claribel	8	Flute harmonique	8	Vox angelica	8
Quinte	6	Flute octaviante	4	Flute octaviante	4
Principal	4	Flauto traverso	4	Gemshorn	4
Flute traversiere	4	Principal	4	Viola	4
Quinte octaviante	3	Twelfth	3	Lieblich flöte	4
Superoctave	2	Fifteenth	2	Flageolet	2
Piccolo	2	Sesquialtera	V	Mixture	III
Sesquialtera	V	Mixture	III	Corno di bassetto	8
Mixture	III	Contra posaune	16	Trompette harmonique	8
Trombone	16	Contra fagotto	16	Clarion harmonique	4
Bombarde	8	Cornopean	8	Cor anglais	8
Trumpet	8	Trumpet	8		
Posaune	8	Hautboy	8		
Clarion	4	Voix humaine	8		
		Clarion	4		

(continued overleaf)

(Specifications — Chapter Three — continued)

(Alexandra Palace: continued)

Solo(14 stops)		Pedal(16 stops)		Couplers, etc.
Violoncello	8	Dble.diapason(w)	32	Solo to Gt.
Viola	4	Dble.diapason(m)	32	Solo suboct.
Flute harmonique	8	Sub-bourdon	16	Solo superoct.
Flute octaviante	4	Open diapason(w)	16	Solo to Ch.
Concert flute	4	Violone	16	Solo to Gt.
Piccolo	2	Contra basso(w)	16	Solo to Gt.suboct.
Claribel	8	Bourdon	16	Solo to Gt.superoct.
Bombardon	16	Octave	8	Ch.to Gt.
Trumpet(harmonic)	8	Principal	8	Solo to Ped.
Ophicleide	8	Superoctave	4	Sw.to Ped.
Bassoon	8	Sesquialtera	III	Gt.to Ped.
Oboe(orchestral)	8	Mixture	II	Ch.to Ped.
Clarinet(")	8	Bombard	32	Ped.in octaves on last three reeds.
Clarion	4	Trombone	16	
		Ophicleide	16	Ped.in octaves on 4ft & two compound stops.
		Clarion	8	

6 "pneumatic combining pistons" to each manual.

"Also numerous pedals which command the various organs on the French system"

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22. ROYAL ALBERT HALL, LONDON — Willis, 1871-2

Great(25 stops)

Flute conique	16	Flute a pavillon	8	Furniture	V
Contra gamba	16	Quint	6	Mixture	V
Violone	16	Flute octaviante	4	Contra posaune	16
Bourdon	16	Viola	4	Posaune	8
Open diapason	8	Octave	4	Trompette harm.	16/8
Open diapason	8	Quinte octaviante	3	Tromba	8
Viola da gamba	8	Piccolo harmonique	2	Clarion harm.	8/4
Claribel	8	Superoctave	2	Clarion	4
Flute harmonique	8				

(continued overleaf)

(Specifications — Chapter Three — continued)

(Royal Albert Hall: continued)

Swell(25 stops)

Double diapason	16
Bourdon	16
Salicional	8
Open diapason	8
Viola da gamba	8
Flûtes à cheminées	8
Claribel flute	8
Quint	6
Flute harmonique	4
Viola	4
Principal	4
Quinte octaviante	3
Superoctave	2
Piccolo harmonique	2
Sesquialtera	V
Mixture	V
Contra posaune	16
Contra oboe	16
Baryton	16
Voix humaine	8
Oboe	8
Cornopean	8
Tuba major	8
Tuba	4
Clarion	4

Choir(20 stops)

Violone	16
Viola da gamba	8
Dulciana	8
Lieblich gedackt	8
Open diapason	8
Vox angelica	8
Principal(harmonic)	4
Gemshorn	4
Lieblich flöte	4
Celestina	4
Flageolet	2
Piccolo(harmonic)	2
Superoctave	2
Mixture	III
Corno di bassetto	16
Clarinet	8
Cor anglais	8
Oboe	8
Tromba harmonique	16/8
Clarion	4

Solo(20 stops)

Contra basso	16
Flute a pavillon	8
Viola d'amore	8
Flute harmonique	8
Claribel flute	8
Voix celeste	8
Flute traversiere	4
Concert flute	4
Piccolo harmonique	2
Cymbale	
*Corno di bassetto	16
*Clarinet	8
*Bassoon	8
*French horn	8
Ophicleide	8
Trombone	8
*Oboe	8
Bombardon	16
Tuba mirabilis	8
Tuba clarion	4

Pedal(21 stops)

Dble.open diapason	32
Dble.open diapason	32
Contra violone	32
Open diapason	16
Open diapason	16
Bourdon	16
Violone	16
Great quint	12
Octave	8
Violoncello	8
Quint	6
Superoctave	4
Furniture	V
Mixture	III
Contra posaune	32
Contra fagotto	16
Bombarde	16
Ophicleide	16
Trombone	16
Fagotto	8
Clarion	8

Couplers,etc.

Solo suboct.
Solo superoct.
Sw.suboct.
Sw.superoct.
Solo to Gt.
Sw.to Gt.
Ch.to Gt.
Sw.to Ch.
Solo to Ch.
Solo to Ped.
Sw.to Ped.
Gt.to Ped.
Ch.to Ped.
Sforzando.

8 pneumatic pistons to each manual.
Tremulants (by pedal) to Sw. and Solo.
Solo stops marked * are enclosed.
Wind-pressures 3" to 24".
Steam blowing.
Compass: Manuals, CC-C. Pedals, CCC-G.

(Specifications — Chapter Three — continued)

23. ST.PAUL'S CATHEDRAL, LONDON — Willis, 1872

Great(14 stops)

Double diapason	16
Open diapason	8
Open diapason	8
Claribel flute	8
Quint	5 1/3
Principal	4
Flute harmonique	4
Octave quint	2 2/3
Superoctave	2
Fourniture	III
Mixture	III
Trombone	16
Tromba	8
Clarion	4

Swell(12 stops)

Contra gamba	16
Open diapason	8
Lieblich gedact	8
Salicional	8
Vox angelica	8
Principal	4
Fifteenth	2
Echo cornet	III
Contra posaune	16
Cornopean	8
Hautboy	8
Clarion	4

Solo(6 stops)

Flute harmonique	8
Concert flute	4
Corno di bassetto	8
Oboe	8
Tuba magna	8
Clarion	4

Choir(11 stops)

Bourdon	16
Open diapason	8
Dulciana	8
Violoncello	8
Claribel flute	8
Lieblich gedact	8
Principal	4
Flute harmonique	4
Flageolet	2
Corno di bassetto	8
Cor anglais	8

Pedal(9 stops)

Double diapason	32
Open diapason	16
Violone	16
Octave	8
Violoncello	8
Mixture	III
Contra posaune	32
Grand bombarde	16
Clarion	8

Couplers,etc.

Solo to Gt.
Sw.to Gt.superoct.
Sw.to Gt.
Sw.to Gt.suboct.
Solo to Ped.
Sw.to Ped.
Gt.toPed.
Ch.to Ped.
Ch.to Gt.
1 pedal Sw.to Gt.

Ventil pedal
4 pneumatic pistons to each manual
4 composition pedals to Gt. & Ped.
1 reversible pedal Gt.to Ped.

Pneumatic-lever and tubular-pneumatic action.
Compass: Manuals, CC-A. Pedals, CCC-F.

Hydraulic blowing (3 engines)

(Specifications — Chapter Three — continued)

24. ALBERT HALL, SHEFFIELD — Cavaillé-Coll, 1873

Grand(16 stops)

Montre	16
Gambe	16
Bourdon	16
Montre	8
Diapason	8
Flute harmonique	8
Gambe	8
Bourdon	8
Prestant	4
Flute	4
Quinte	2 2/3
Fourniture	V
Cymbale	IV
Bombarde	16
Trompette	8
Clairon	4

Récit(12 stops)

Bourdon	16
Diapason	8
Gambe	8
Voix celestes	8
Flute traversiere	8
Viole d'amour	4
Flute octaviante	4
Doublette	2
Cornet	IV
Cor anglais	16
Trompette	8
Clairon	4

Positif(12 stops)

Quintatön	16
Principal	8
Nachthorn	8
Unda maris	8
Prestant	4
Flute douce	4
Quinte	2 2/3
Doublette	2
Piccolo	1
Basson-hautbois	8
Cromorne	8
Voix humaine	8

Solo(12 stops)

Bourdon	16
Diapason	8
Flute harmonique	8
Flute octaviante	4
Quinte	2 2/3
Doublette	2
Tierce	1 3/5
Clarinette	8
Musette	8
Tuba magna	16
Trompette	8
Clairon	4

Pédale(12 stops)

Flute	32
Contre basse	16
Violon basse	16
Sous basse	16
Great quinte	10 2/3
Principal	8
Violoncelle	8
Corno dolce	4
Bombarde	32
Bombarde	16
Trompette	8
Clairon	4

Accessories

2 ventil knobs each to Gd., Solo, Ped.
1 each to Pos.& Rec.
10 couplers (by pedal).
5 reed-ventil pedals.
Tremulants to Pos. & Rec.(pedals).
Thunder-pedal.
Compass:
Manuals, CC-C.
Pedals, CCC-F.

Balanced swell-pedals to Rec.& Pos.
Lever-pedal to Solo. Barker-lever action.

Reversed console.

(Specifications — Chapter Three — continued)

25. WORCESTER CATHEDRAL — Hill, 1874

Great(14 stops)

Dble.open diapason	16
Bourdon	16
Open diapason No.1	8
Open diapason No.2	8
Gamba	8
Stopped diapason	8
Principal	4
Harmonic flute	4
Twelfth	2 2/3
Fifteenth	2
Full mixture	III
Sharp mixture	IV
Posaune	8
Clarion	4

Swell(13 stops)

Bourdon	16
Open diapason	8
Salicional	8
Stopped diapason	8
Principal	4
Lieblich flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Double trumpet	16
Cornopean	8
Oboe	8
Clarion	4

Choir(9 stops)

Open diapason	8
Dulciana	8
Salicional(ten.C)	8
Hohl flöte	8
Principal	4
Wald flöte	4
Flautina	2
Dulciana mixture	II
Clarinet	8

Solo(4 stops)

Vox angelica	8
Harmonic flute	4
Tuba mirabilis	8
Vox humana	8

Pedal(13 stops)

Dble.open diapason	32
Dble.open diapsoon	32
Open diapason	16
Open diapason	16
Violone	16
Bourdon	16
Principal	8
Violoncello	8
Twelfth	5 1/3
Fifteenth	4
Mixture	III
Trombone	16
Clarion	8

Couplers,etc.

Sw.to Gt.
Sw.oct.
Sw.suboct.
Solo to Gt.
Sw.to Ch.
Gt.to Ped.
Sw.to Ped.
Ch.to Ped.

Pedal "forte" ventil.
10 composition pedals
(4 Gt.& Ped.,3 Sw.,3 Ch.)
Solo tremulant (pedal).

Pneumatic action to
Gt.,Sw.& couplers.

Hydraulic engine for
blowing.

Compass: Manuals, CC–A.
Pedals, CCC–F.

(Specifications — Chapter Three — continued)

<u>26. BOLTON TOWN HALL</u> — Gray and Davison, 1874

<u>Great(11 stops)</u>

Dble.open diapason	16
Open diapason	8
Viola	8
Claribel flute	8
Principal	4
Flute octaviante	4
Quint mixture	II
Great mixture	V
Double trombone	16
Harmonic trumpet	8
Clarion	4

<u>Pedal(8 stops)</u>

Dble.open diapason	32
Contra bass	16
Bourdon	16
Violon	16
Clarabella	8
Violoncello	8
Trombone	16
Trumpet	8

Compass:

Manuals, CC-C
Pedals, CCC-F

<u>Swell(14 stops)</u>

Lieblich bourdon	16
Open diapason	8
Viol da gamba	8
Voix celestes	8
Lieblich gedackt	8
Salicet	4
Nazard	2 2/3
Flautino	2
Mixture	III
Vox humana	8
Corno di bassetto	8
Hautbois	8
Trumpet	8
Clarion	4

<u>Couplers,etc.</u>

Sw.to Gt.
Sw.to Ch.
Solo to Ch.
Solo to Gt.
Ch.to Ped.
Gt.to Ped.
Solo to Ped.
Sw.to Ped.
Sw.suboct.
Sw.superoct.
Solo suboct.
Solo superoct.
Tremulant to Sw.reeds
Tremulant to Solo cor anglais & clarinet

<u>Choir(8 stops)</u>

Bourdon	16
Violin diapason	8
Vox angelica	8
Lieblich gedackt	8
Flauto traverso	4
Piccolo	2
Echo dulciana cornet	V
Trumpet	8

<u>Solo(7 stops)</u>

Concert open diapason	8
Flute harmonique	8
Flute octaviante harmonique	4
*Cor anglais	8
*Clarinet/Bassoon	8
Tuba mirabilis	8
Carillon(bells)	4

(*enclosed)

4 ventils Gt. & Ped.
3 ventils Sw.

2 hydraulic engines.

(Specifications — Chapter Three — continued)

27. ST.PETER'S CHURCH, EATON SQUARE, LONDON — Lewis, 1874

Great(18 stops)

Open diapason	16
Bourdon	16
Open diapason No.1	8
Open diapason No.2	8
Hohlflöte	8
Viola da gamba	8
Viola	8
Stopped diapason	8
Octave	4
Hohlflöte	4
Gemshorn	4
Quint	2 2/3
Grand mixture	V
Full mixture	II
Mixture	IV
Trumpet	16
Trumpet	8
Clarion	4

Choir organ enclosed.

Great organ on three separate soundboards: Pedal on five.

Swell(13 stops)

Rohr bourdon	16
Geigen principal	8
Flute harmonique	8
Rohr flöte	8
Viola da gamba	8
Voix celestes(ten.C)	8
Geigen principal	4
Flute harmonique	4
Mixture	III
Contra fagotto	16
Horn	8
Oboe	8
Clarion	4

Details of couplers, composition pedals and other accessories are not recorded, but are described as being "ample".

Choir(12 stops)

Lieblich bourdon	16
Lieblich gedackt	8
Dulciana	8
Salicional	8
Flauto traverso	8
Lieblich flöte	4
Flauto traverso	4
Salicet	4
Mixture	III
Orchestral oboe	8
Clarinet	8

Pedal(9 stops)

Great bass	16
Violon	16
Sub-bass	16
Quint bass	10 2/3
Octave bass	8
Violoncello	8
Flute bass	8
Posaune	16
Trumpet	8

(Specifications — Chapter Three — concluded)

28. "THE HALL", PRIMROSE HILL, REGENT'S PARK — Bryceson Bros. & Morten, 1875

(Mr. Nathaniel J. Holmes' residence)

Great(14 stops)

Double diapason	16
Open diapason	8
Viola	8
Hohl flöte	8
Flauto traverso	8
Salicional	8
Dulciana	8
Principal	4
Flute harmonique	4
Twelfth	3
Fifteenth	2
Full mixture	III
Trumpet	8
Clarion	4

Swell(16 stops)

Double diapason	16
Open diapason	8
Keraulophon	8
Hohl flöte	8
Lieblich gedackt	8
Voix celestes	8
Principal	4
Lieblich flöte	4
Octave flageolet	1
Echo cornet	III
Contra fagotto	16
Cornopean	8
Hautbois	8
Vox humana	8
Corno di bassetto	8
Clarion	4

Choir(12 stops)

Lieblich bourdon	16
Spitz flöte	8
Viol di gamba	8
Echo dulciana	8
Lieblich gedackt	8
Violin flute	8
Octave viola	4
Flute harmonique	4
Lieblich flöte	4
Piccolo	2
Cor anglais	8
Clarinet/Bassoon	8

Solo(6 stops)

Clarinet(enclosed)	8
Orchestral flute	8
Piccolo	2
Tromba	8
Contra trombone	16
Carillon(61 bells)	4

Echo(6 stops)

Bourdon doux	16
Corno dolce	8
Viol d'amour	8
Voix celestes	8
Flute douce	4
Harmonica	III

Pedal(11 stops)

Dbl.open diapason	32
Contra bass	16
Sub-bass	16
Violon	16
Violoncello	8
Bass flute	8
Super octave	4
Contra bombarde	32
Trombone	16
Bassoon	8
Trumpet	8

Couplers,etc.

Solo to Ped.	Swell superoct.
Gt.to Ped.	Swell suboct.
Sw.to Ped.	Sw.to Gt.
Ch.to Ped.	Sw.to Ch.
Ventil to Ped.	Ventil to Ch.
Ventil to Echo.	Tremulant to Sw.
Solo to Gt.	Tremulant to Solo reeds.

21 "adjusting pedals" for control of couplers, ventils, etc.

8 combination pistons.
8 composition pedals.

Balanced swell-pedals to Sw. & to Solo clarinet.

Pneumatic action, except to Echo(100 ft.from console), which is electro-pneumatic.

Compass: Manuals, CC-C; Pedals, CCC-F.

Blown by 11 h.p. steam-engine.

(Designed by W.T.Best)

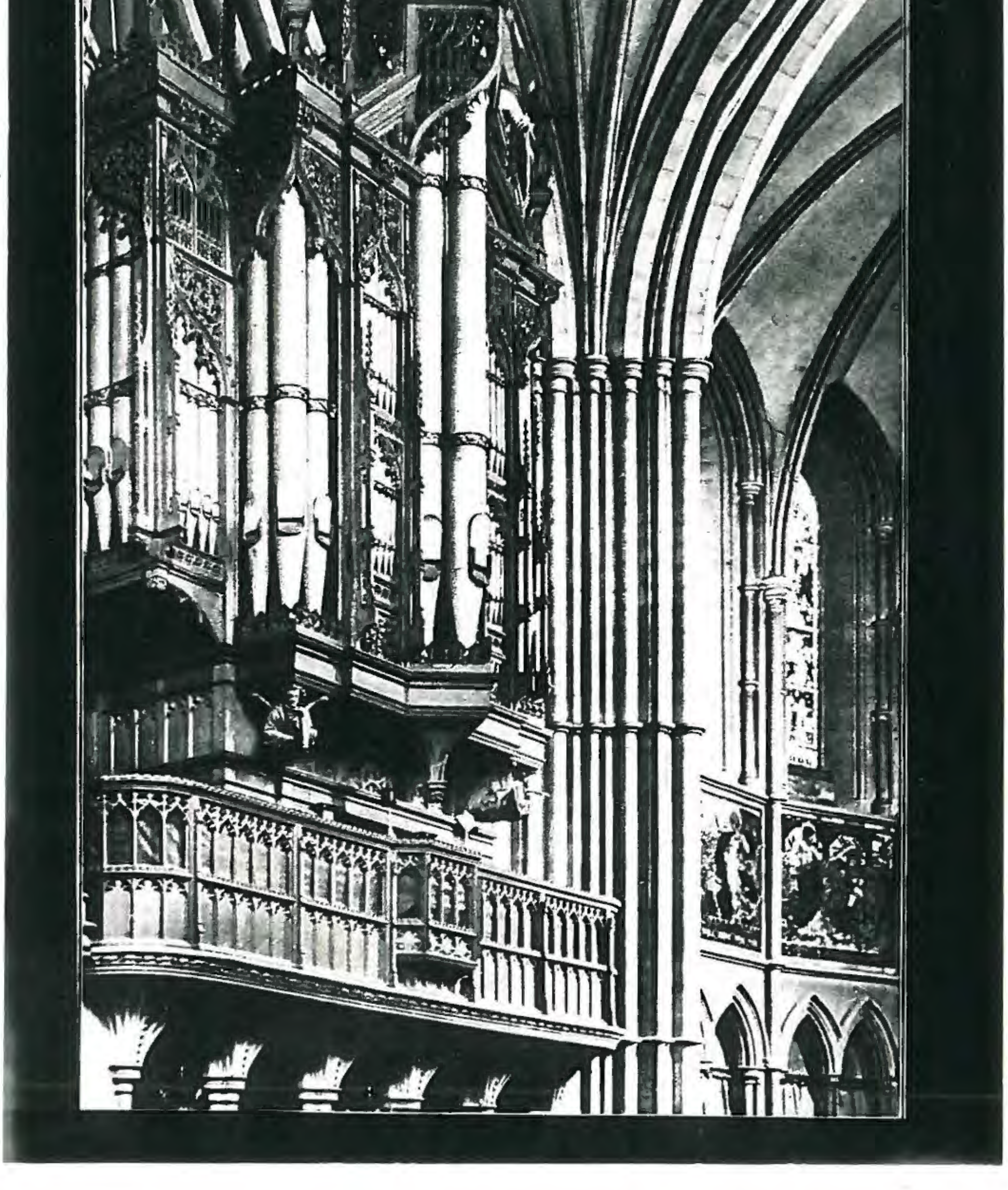

PLATE XIII.

St. Bartholomew's, Armley, Leeds.

This organ was built by Schulze in 1869, and, although it is not nearly as large as the Doncaster instrument, it is considered to be Schulze's finest work as far as tonal effect is concerned. Unforced voicing on low wind-pressures, ample speaking-room for the pipework, and the admirable acoustics of a splendid new nineteenth-century church — these factors, coupled with the genius of Schulze, provide the reasons why this organ has few equals. The case also is impressive, on its spacious gallery in the north transept, with the pipes of the 16ft Pedal open prominently displayed.

(Photograph by R. Nichols, from Org.5.25)

CHAPTER FOUR -- 1876 TO 1899.

General trends during the fourth quarter-century.

The final twenty-five years was a period of tremendous activity in the organ world; it marked not so much the end of the nineteenth-century organ as the beginning of the twentieth. Even now that more than half of the new century has passed away, there are very few major constituent parts of the modern instrument's tonal or mechanical equipment which are not, in their origins, pre-1900.

It was not a period of growth in size, as the third quarter had been. Best's dictum that the day of the monster organ had passed was quite true; the only real "monster" of this time was the one built for Sydney Town Hall in 1890. Now that a comfortable limit of size had been reached, a certain amount of clarification of tonal principles was desirable. Thus we find the two opposing camps of Willis and of Lewis; the one asserting the importance of the heavy chorus-reed; the other following the Schulze tradition of bold and brilliant flue-work.

Other builders ranged themselves in various intermediate positions, with the exception of the rather startling newcomer Hope-Jones, who stood alone, dependent on no previous tradition; rather was he flying directly in the face of most of the existing tenets of organ-building. Intent on his own firmly-conceived ideals, many of whose effects — good and bad — are with us still, he had a healthily stimulating influence on his rivals and fellow-craftsmen. The differences between the Willis and the Schulze-Lewis schools of thought seemed to diminish in the new light thrown on the scene by Hope-Jones' operations; the major issue now was not so much the question as to whether reed-chorus or the flue-chorus should be the predominant one, but as to whether there should be any chorus at all. Certainly the twentieth-century organ has very properly pursued much more of a middle course, combining the best parts of both extremes, since Hope-Jones left the Old World for the New.

Another prominent figure to appear was Thomas Casson, remembered nowadays mainly as the "Father of the Pedal Organ", and more thoroughly deserving of the title than many other men are of similar historical paternity-awards. His practical doctrine of the "suitable bass", his advocacy of borrowing and extension as an economical and musically satisfactory means of achieving this end, have had results of real and permanent value: every modern Pedal specification bears witness to his teaching.

The list of the period's developments and innovations which have survived as essential parts of the organ of to-day, makes impressive reading. Tonally, the English full-Swell found its feet, and both Solo and Pedal organs became much more varied and useful departments. The "acoustic 32ft" and the Diaphone were new voices which were a further symptom of the increased interest in the Pedal. Mechanically, the principal features were the great improvements in the tubular-pneumatic and electro-pneumatic actions, the more regular appearance of stop-keys and of balanced swell-pedals, the debut of electric blowing, and the new systems of adjustable combination-mechanism. It was now possible — and most appropriately so in the Naughty Nineties — for a number of organists to be able to "change their combinations without leaving their seat."

The College of Organists, themselves an important factor in the story of the nineteenth-century organ, took a valuable step in 1881 by summoning a conference on organ-construction. Naturally enough, the controversial and perhaps misguided decisions have since gained publicity; but the College's influence was very potent in standardising many of the instrument's outwards systems of mechanism and control, which had hitherto been developing, at the hands of a growing number of builders, along individual and haphazard lines.

<u>The Great Organ</u>

We have in the last Chapter seen how the Great reached what we should regard as almost its full growth, both in size and in tonal plan. The general outline-design of the well-developed Great had become clarified in the hands of the principal craftsmen, though each of them — fortunately for the art of organ-building — applied his own particular touches of detail. Fresh viewpoints, moreover, had been presented from two different directions overseas.

During the final quarter-century, no radical alterations occur in the Great's tonal-scheme, apart from the short-lived Hope-Jones revolution. What does happen is a slight, but noticeable, reduction in the size of the average Great, while at the same time the organ as a whole tends to become slightly larger. The explanation of this apparent anomaly is the general levelling-up of the various departments of the organ: where previously organs have often consisted of a huge Great, a somewhat smaller Swell and an insignificant remainder, we now find a much more even distribution — in fact, the Swell henceforward is, as often as not, bigger than the Great.

Most Greats are still to be found in the ten-to-thirteen-stop group; but there is a definite decline in the number of larger departments than this, balanced by a corresponding increase in Greats of seven or eight stops. The most important problem of tonal-design was becoming clear-cut: to what extent should the Great flue-work predominate, and what role should reeds play in the ensemble ? On the one hand there was Willis, with his splendid specimens of heavy-pressure chorus-reeds, whose harmonic trebles and loaded tongues produced the maximum brilliance and sonority of tone; on the other, there was the Schulze school represented by T.C.Lewis, with Walker also upholding the cause of the flue-chorus, but by different methods. In between, maintaining a middle course which avoided either extreme, came Hill and the majority of lesser firms.

Undoubtedly Willis was the man of the moment; a very large share of the most important contracts went his way (though Hill was by no means unemployed) and from many points of view his work now was finer than before. His reputation since the Exhibition had rested mainly on his concert instruments of almost sensationally large size. Then, in 1872, came his 52-stop rebuild at St. Paul's Cathedral, followed by a glorious succession of Cathedral organs which have done more than anything else to account for the veneration with which the name of Father Willis is regarded to-day: Salisbury, Durham, Edinburgh, Oxford, Canterbury, Coventry, Truro, Exeter, Hereford and Lincoln. None of them was larger than 58 stops; but it was these instruments that stamped him as an artist, as a genius; whereas his earlier work, up to the Albert Hall organ, had shown him more strongly in the guise of an outstandingly clever inventor and engineer who also happened to possess great skill in his craft, but whose fame certainly derived a measure of its brilliance from the unique size of his most celebrated works. Now, in the closing decades of the century and of his own long lifetime, Willis showed himself worthy of the buildings which he was called upon to adorn.

His Greats settled into a fairly regular pattern, as was to be expected of a builder whose output was so large, and in whom thirty years of experience and experiment had implanted unshakable principles and ideals. The words "regular pattern" must not, of course, be taken to imply "mass-production" or anything approaching it; two organs built simultaneously with identical specifications by the same craftsman can still be given completely different tonal complexions by the voicer who finishes each organ in the building for which it is intended. Willis, for the most part, favoured a flue-chorus of nine stops, consisting of a double (open on the larger instruments, otherwise stopped), two unison opens and a stopped diapason or flute, 4ft principal and flute, twelfth, fifteenth and mixture, topped by two or three reeds.

It was, at first, only in his Cathedral organs that the full reed trio in 16, 8 and 4ft pitches was provided, but in the late eighties and early nineties a handful of other organs was similarly equipped. The larger Greats of fifteen and sixteen stops at Salisbury and Durham, both in 1876, added an extra 8ft flute and 2ft piccolo to this nine-stop flue basis, with an 8ft gamba also at Durham. Willis' famous electro-pneumatic organ at Canterbury in 1886 had a Great of similar size to Durham's, but with a Salicional instead of the Gamba; Coventry and Truro in the following year were both of the twelve-stop pattern (i.e. nine flues and three reeds), as was Gloucester in 1888. Exeter, Hereford and Lincoln in the nineties were all slightly larger with fifteen, sixteen and fifteen stops respectively. Hereford was the only one of Willis' Cathedral Greats to have two flue doubles, and all these organs had a third open diapason instead of the gamba or salicional of earlier Greats.

Willis has at various times been criticised for allowing his reeds to play too large a part in the Great ensemble; for including a second flue double too seldom and a reed double too often; and for failing to make sufficient tonal distinction between full Great and full Swell. Such criticism has, however, rarely been more than half-hearted, and has been quickly silenced by the sounds of Canterbury, Salisbury, Lincoln — in fact, of any of his organs which have survived until recent years in exactly the state in which Father Willis left them. His chorus-reed wind-pressures varied from seven to nine inches, which was not heavy for the great spaces in which they were to speak; and although his flue choruses may not have had the flashing, scintillating "peal" of the Schulze ideal, there was nevertheless nothing insipid about them. One of this century's most experienced and level-headed writers on the organ, Gilbert Benham, has summed-up his views in these words:

1) "I fully appreciate the artistry of modern organ-building, no matter by whom, but I submit that the tone and ensemble of a Father Willis organ has not been reproduced since his death; at any rate, I have not met an example. Ideals change, methods change, and in one or two quarters we have undoubtedly reached a standard as high as that of Willis, but it is quite different. Like other builders

1. [illegible]. Org.10.155

and all men, Willis at times made mistakes, but taking his average instrument, nothing built to-day surpasses it. In short, modern methods could teach the old man nothing; rather would it be to the advantage of the art of to-day were it to continue his work....

"Speaking very broadly, Father Willis set out to provide an inspiring and brilliant ensemble; and he succeeded. There is a world of difference, it seems to me, between mere shrillness and that elusive, transparent brilliance which no words can describe. Schulze also knew the secret as far as his own flues were concerned, and no mere copying of scales will impart it; it lies within the man's soul, or it does not. Personally, I revel in a Father Willis diapason just as much, but no more, than in a Harrison or a Hunter. It is a hindrance to one's appreciation of the best if one's ears welcome only one particular class of tone, whether it be flue or reed."

The Willis Great may be concisely portrayed in the words of the same writer. In the following passage, he is describing an organ built in 1889 -- i.e. midway between Canterbury-Truro-Coventry on the one hand and Exeter-Hereford on the other -- in the North London church of St.Augustine's, Highbury. This was one of the twelve-stop schemes, with the three reeds on seven inches of wind; it was conceived on Cathedral lines, in a spacious parish church, and may be regarded as a typical specimen of "late Father Willis", at a time when the old man, though assisted by his sons Vincent and Henry (brother George had died some years earlier), was still very actively in charge of operations: eye-witnesses of the Lincoln Cathedral rebuild in 1898, when Willis was 78, have testified to this.

1) "This impressive diapason chorus" writes Benham concerning the Highbury instrument, "is satisfying and seemingly complete in make-up, without reaching the maximum force the ear can tolerate. The build-up is not by leaps, but by normal steps, so no undue caution is necessary when a stop is added.

"The reeds come on with the true Willis tradition. They do not change the Great to the point of obliteration, but they make a considerable difference. Accepting the basic tone of the Great as diapason, then we must judge this reed chorus as amply sufficient. They turn an already powerful chorus into one of great power, and the increase is definitely trumpet tone. One needs to recognise the Willis ideal with regard to balance of tone, for his trumpets were so excellent that few would complain if his sometimes light diapasons, especially those of 8ft pitch, were more or less swallowed up. These trumpets impart a definite and powerful reed tone, they mix with the diapasons well, and increase the power considerably......"

There were many points in common between Willis and Lewis, although on the major question of flue-to-reed balance they were poles apart: Lewis used to remark, "If I thought Willis were right, I

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1. Org.16.29

should shut up shop to-morrow." But at least both of them regarded the chorus as of the utmost importance; the achieving of a proper ensemble was the supreme object. Both men made very lovely flute stops; both of them voiced their chorus-reeds, whether the pressure was three inches or nine, to be true trumpets with plenty of fire and "clang", and thus ensured optimum blend. The modern tromba, with its "fat" tone and its assertive, smothering effect on the flue-chorus, was not for them.

The essential difference between them lay in Lewis' determination that the flue stops should predominate and should provide their own brilliance, while Willis placed much more reliance in reed tone, often seeming to restrain his flues (especially the upperwork) to this end. Lewis' output was not nearly so spectacular as Willis'; he made his name from a number of medium-sized organs of thirty to thirty-five stops, though there were three Cathedrals on his list, with rather larger instruments, the last of which (Southwark, 1897) was his masterpiece; and important concert-halls such as St.Andrew's Hall, Glasgow, and the People's Palace, London. Something has already been said about his fine organ in St.Peter's, Eaton Square.

In general, his method was to provide his large unison open diapason with a bold, ringing, weighty tone, with upperwork -- and especially mixtures -- to match. He used heavy wind very sparingly and modestly for his reeds; twelve inches was his maximum even for the solo reeds at the People's Palace and at Southwark, and indeed, although his reeds were much better than Schulze's, they were still his weakest point. His mixtures were designed to add that final climax which Willis achieved with his reeds. Lewis at St. Peter's, Eaton Square in 1874 had on his Great a trio of mixtures, totalling eleven ranks and including one of five, out of a total of fifteen flue-stops. Newcastle Cathedral (1890) had two mixtures among thirteen flues, totalling seven ranks; and Southwark Cathedral (1897) had two among twelve, with nine ranks altogether.

Even in his small parish-church Greats of seven or eight stops, the single mixture was always a virile four-rank specimen. His 4ft principal was usually voiced midway in power between the two 8ft diapasons (instead of being kept down to the level of the second, as is more often the case) and the fifteenth brighter still. Small wonder, then, that his Great reeds, such as the solitary trumpet on light pressure at Southwark, are almost negligible when added to full flues with mixtures.

Just before the end of the century, Thomas Lewis himself handed over the control of his business to others; and during the early years of the present century the new "Lewis and Company" worked on lines very different from the unyielding, unchanging policy of their founder. In fact, they often found themselves rebuilding one of his earlier works, and correcting what they then thought to have been his mistakes in the process -- the 1902 rebuild of the Eaton Square organ is a case in point, where the glorious 1874 Great was rendered comparatively characterless. Thomas Lewis himself must have derived a certain amount of celestial satisfaction and amusement, not unmingled with a sense of irony, , when the firm of Lewis was, after the first World War, absorbed into -- of all firms ! -- that of Willis.

James John Walker, son of Joseph William who died in 1870, was another great builder to whom the diapason chorus was paramount; and to maintain this ideal he struck out along his own line, owing no allegiance to any particular model. His technique was to endow his massive unison diapasons with, as he himself put it, "high pressures and large scales", providing a flood of pure, rolling diapason tone -- "real church tone", in his own words. High pressure, in this connection, must not be taken to mean the 8 or 9 inches Willis used for his reeds. In fact, Walker's normal pressure for his flues was 4½ or 5 inches, about an inch more than his contemporaries used. His upperwork fitted cohesively onto this foundation, but avoided excessive brilliance; refinement was the prime object. Walker's work is aptly summarised by another learned contemporary writer, Bonavia-Hunt:-

1) "Walker introduced a singular majesty and dignity into his organs, best expressed by the Roman word 'gravitas' (signifying 'weight, dignity, importance, seriousness and gravity' -- the

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1. N.A.Bonavia-Hunt, Org.31.26

ideal characteristics of the Roman nobleman). The marvel is that he was able to combine all this dignity and weight with upperwork! He succeeded where those failed who either cut out the upperwork or else tacked it on with a seam that stood out a mile."

Walker's finest work during this period came in the late eighties and in the nineties: Romsey Abbey; St. Mary's, Portsea; Christ Church, Lancaster Gate; Holy Trinity, Sloane Street; St. Matthew's, Northampton; and St. Margaret's, Westminster -- all of them between 37 and 50 stops, and all of them remarkable examples of the work of a great man. In these organs, there were nearly always three unison opens of varying sizes, (Sloane Street had what amounted to a fourth, labelled Salicional) and the reeds stood on pressures of about an inch more than the flues.

An unusual, and not very successful, experiment was tried on the Sloane Street instrument: in place of 4ft reeds on Great and Swell, Walker provided a three-rank "Clarion mixture" of high-pitched flue pipes; he had done this also at Portsea two years earlier, but the additional mixture cannot have been as useful as a genuine clarion, the need for which was especially stressed by the presence of 16ft reeds in both organs.

Nevertheless, the diapasons at Sloane Street were about the finest that Walker ever produced; and another splendid example of the Walker Great was found at Romsey Abbey -- it was, indeed, his largest Great of this period, with fifteen stops out of a total, for the whole organ, of thirty-seven. It was also the only one with two flue doubles, and the upperwork was unusual in that, although there was no separate twelfth, there was an independent tierce (1 3/5 ft); the two mixtures totalled five ranks, and the reeds were at 8ft and 4ft only.

It is interesting to observe that Walker organs, during the nineteenth century, were never outstandingly large; there was in fact only one organ of more than sixty stops, and not a tremendous number over fifty. Yet this firm kept its artistic position among the leaders of British organ-building from the time of its foundation before the middle of the century; and it has remained strong enough to survive the economic processes to which such firms as Lewis' later succumbed, until to-day its reputation stands higher than ever.

There was something about Walker's work that provokes the description "typically English", in the best sense of that not always complimentary phrase. Certainly he owed less than did Willis or Lewis to any foreign influence; and, after all, Joseph William Walker, the first of the line, had learned his craft from G.P.England and succeeded to a business tracing its ancestry back to John Harris, son of Renatus. The Walker traditions thus went back to the Restoration.

Another great firm whose work was the product of more than a century's experience of the craft in Britain was that of Hill, whose organ-building parentage went back through his father-in-law Elliott to Hutt, the partner of Snetzler's foreman and successor, Ohrmann. Gray and Davison could also trace their descent from Snetzler in the same way (William Hill had been a partner of Davison in 1837-8), but their greatest days seemed to have passed by the time the century entered its final quarter; and although their output of instruments was quite steady and continuous, they never again attained the eminence which was theirs in the fifties.

The firm of Hill was, commercially speaking, the only serious competitor of Henry Willis; and the list of major Hill contracts in the closing period of the century, though not so studded with Cathedrals as was the Willis list, makes nevertheless just as splendid reading: Westminster Abbey, for instance, and King's College, Cambridge; Beverley Minster and Peterborough Cathedral; and the world's largest organ (as it remained for several years) built for the Town Hall of Sydney, Australia.

By a curious coincidence, William Hill died in the same year as Joseph William Walker -- 1870; but he, like Walker, was succeeded by a son in whose hands the firm's reputation was not only maintained but even enhanced. The Hill characteristic Great was largely diapason, with big mixtures of bright and silvery tone; the chorus-reeds, which in the bigger organs were on slightly increased pressures but not nearly as powerful as Willis', played an important but not over-assertive part in full Great. Beverley Minster, for instance, built in 1885 with seven ranks of mixtures among its twelve flue-stops, and with reeds of 8ft and 4ft pitch, has a sparkling, bell-like quality about its ensemble which, added to the effect imparted by the lovely environment in which it stands, makes it one of the most exquisite church organs in Britain, and admirably suited for most types of organ-music.

The Westminster Abbey organ had been in the hands of the Hills since 1828, and so it remained for over a hundred years. Many people have wondered, in view of the outstanding series of Cathedral organs built by Willis, why it was that Westminster did not find its way into that number. Such a question is, of course, rather unfair to Messrs. Hill, implying as it does that Willis alone was capable of providing the Abbey with a worthy instrument. But perhaps it is not widely known that Willis very nearly did secure the contract for the rebuild which was ultimately carried out by Hill in 1884.

A few years ago, Willis' correspondence with the Abbey author-
1) ities (or at least a portion of it) was published, revealing that he was consulted by them and that he went so far as to submit a detailed plan and specification — one which is so interesting that it is reproduced at the end of this chapter, although the organ was never built. The seventeen-stop Great will be seen to include four unison open diapasons, as well as flute tone at 16, 4 and 2ft pitches but not,

1. Org.23.168 foll.

oddly enough, at the unison. Incidentally, the published correspondence displays Willis as the possessor of a delightfully fluent literary style and a fine command of words, such as has long disappeared from business correspondence in these days of scientific and technical training ("education" is no longer the appropriate word) in which letter-writing is limited to the stereotyped basic phrases of commercial stenography. We are not told why Willis' negotiations with the Abbey authorities came to nought: perhaps that will in due course be explained in Professor Sumner's promised biography of the great man.

The Sydney organ merits a few words to itself. Its 28-stop Great comprised a 32ft Contra-bourdon (to Tenor C only), open and stopped doubles, and ten unisons -- four opens, two strings, four flutes; this was followed by a quint, four 4ft stops (two opens, a string and a flute), four compound stops totalling sixteen ranks, and reeds at 16, 8, 8 and 4ft. A tabular comparison of the three largest Greats of the century, separated by equal intervals of time, will show the essential differences in balance and colouring between the Willis and the Hill outlooks:-

	Total stops	Subfoundation	Unisons	Quint to 15th	Mixtures	Reeds
St.George's Hall(1855)	25	1 @ 16ft	6	9	3 = 11 rks	6
Albert Hall(1872)	25	4 @ 16ft	6	7	2 = 10 rks	6
Sydney (1890)	28	(1 @ 32ft) (2 @ 16ft)	10	7	4 = 16 rks	4

Into this world dominated by Willis, Lewis, Walker and Hill, with their various styles and their individual personalities which stamped each of their instruments with the unmistakable tonal signature of a great artist, there suddenly burst a very different figure in the last decade of our period, Robert Hope-Jones.

This telephone-engineer and part-time organist-choirmaster bequeathed much that was valuable to his adopted craft, and though some of his theories were mistaken, he nevertheless was a figure of immense importance in the world of organs for more than ten years until his departure for America in 1903.

His most valuable improvements were on the mechanical side, and will be discussed in their proper place later in this chapter; moreover, it was this department that was his "first love" in organbuilding, for when he rebuilt his organ at St.John's Church, Birkenhead for the first time in 1887, he left the tonal scheme practically intact but incorporated most of the mechanical innovations associated with his name. Seven years later, he again reconstructed this organ, and the tonal side of it then underwent a marked change. By that time, he had already announced his policy of discarding mutations and mixtures altogether: purity of tone was the objective, and brilliance was to be built up from within the foundation, not superimposed on it by means of extra stop. Heavily-winded diapasons, keenly-voiced strings, stops of the quintatön type with the twelfth sounding as strongly as the prime tone (almost a two-rank mixture, in fact), powerful reeds of very free, orchestral tone: these were the constituents of the Hope-Jones ensemble, with his newly-invented Tibia family of stops to secure the blend and cohesion of the whole.

In his 1894 Birkenhead rebuild, he added a Tibia plena to the existing four unison flues, and abolished the 4ft flute, twelfth, 3-rank mixture and 4ft reed. A year later, the first of his two organs in St.George's, Hanover Square, had an eight-stop Great beginning with a tibia plena followed by a diapason phonon. This was the name he gave to his new type of open diapason, voiced to produce a refined, full, weighty tone, and usually on increased wind-pressure: it derived its particular effect from the leather strip covering the lip of each pipe. These "leathered diapasons" were in due course adopted by a number of builders, and in the hands of a first-class voicer they have certainly come to be effective in certain conditions.

The Hanover-Square Great continued with 8ft open and stopped diapasons, 4ft principal and harmonic flute, 2ft piccolo and 8ft tuba: no double, no twelfth, no open metal fifteenth, and no mixture. Next year (1896) came the Hope-Jones "magnum opus" at Worcester Cathedral;

here, as compared with the Hanover-Square organ, the Great had, in addition, a 16ft diapason phonon, an 8ft viol d'amour, a 4ft quintadena (i.e. quintatön), and a 16ft tuba. This Hope-Jones instrument at Worcester was his largest as a whole, though his largest Great came a year later in the M'Ewan Hall, Edinburgh, where there was an extra 4ft flute over and above the Worcester specification. Thus the complete Great pattern now became: 16,8,8,8,8,4,4,4,2,16,8. (Compare this with the typical Willis twelve-stop scheme: 16,8,8,8,4,4,2,2/3,2,III, 16,8,4).

At Llandaff Cathedral in 1898, Hope-Jones provided an even more extraordinary-looking Great — seven stops, comprising tibias at 16ft and 8ft, open diapason and hohl flute at 8ft, and reeds at 16, 8 and 4ft. Admittedly one cannot form a final judgement merely from the appearance of an organ on paper; but one can gain a reasonably accurate impression. A good-looking specification may often sound thoroughly bad; but a really bad design will never turn out to be very good in its tonal effect, no matter how cleverly the individual stops may be voiced -- and there is no doubt of Hope-Jones' skill in this direction. The general consensus of opinion among those who examined and tested these instruments of his in their original state, (most have long since been rebuilt and reorganised) is that, while their ensembles are better than they look on paper -- they could not well be worse ! -- yet the effect on the whole is lifeless and heavy;

the foundation is massive, but the theoretically self-induced brilliance is not there, nor is the blend and cohesion. Individually, some of the stops were splendid specimens of new and unusual tone-colours, but as far as the chorus was concerned Hope-Jones failed completely on the Great, though faring slightly better in other departments. Refinement of tone he certainly secured; but that was not enough.

The final quarter-century saw the rapid rise to prominence of three new firms who have taken their places in the forefront of the craft to-day -- Norman and Beard, Harrison and Harrison, and Hele. Curiously enough, the first two of them had a certain connection with Hope-Jones; Norman and Beard were for a short time in partnership with him at Norwich, though neither partner seems to have had much influence on the other's work, as will be seen from a comparison of the Llandaff organ (Hope-Jones 1898) with that in Norwich Cathedral (Norman and Beard, 1899) -- both of them built during the period of partnership. Harrison and Harrison may be said to have adopted much that was good in Hope-Jones' work, especially the leathered diapasons and the pursuit of extreme refinement of tone, but they did not make the mistake of stopping there, as they soon showed in the organs that began to make their nationwide reputation in the early years of the twentieth century.

During the period of the present chapter, the Harrison firm built two large instruments which gave a clear indication that this was no ordinary firm of builders. At St. Martin's, Scarborough (1877) the thirteen-stop Great was on sound, straightforward lines, with ample upperwork; this four-manual of 55 stops had several unusual features which will be referred to later in this chapter. Ten years later, their 60-stop organ at St. Giles' Cathedral, Edinburgh (the first of a long line of Harrison cathedral instruments) had sixteen stops on the Great, with such interesting features as gambas in 16, 8 and 4ft pitches, a second flue double, seven ranks of mixtures, and a complete reed chorus.

Norman and Beard were lucky indeed to have the opportunity presented to them, on their own doorstep at a very early stage in their career, of replacing the aged Bishop instrument which had been allowed to remain unaltered in Norwich Cathedral for sixty-six years; it must assuredly have been the most decrepit Cathedral organ in the country by the time the authorities finally decided to do away with it. Norman and Beard rose to the occasion worthily, by building one of the finest organs ever produced by them, in the year 1899 -- a five-manual of 64 stops. The Great had a full complement of open metal stops, including a double and three unisons, in its eleven flues; and both here and at Chelmsford Parish Church (now the Cathedral) in the same year, the partners showed that their feet were set on the right road, and that their intention was to keep midway between the tonal extremes represented by Willis and Lewis. Their reed wind-pressures tended to be very moderate: at Chelmsford, for example, the Great reeds were on the same pressure as the flues, 4 inches; only the Swell and Pedal reeds — and the Tuba— were raised to the modest pressures of 6, $7\frac{1}{2}$ and 7 inches respectively.

An interesting reconstruction took place in 1878 at the Temple Church, where the Robson organ of 1862 was enlarged by two of his pupils, Messrs. Forster and Andrews, whose establishment at Hull was acquiring a far from local repute, as this present example will prove. The 1878 Temple organ is of especial historical value, as it may be taken as representing

1) "what was probably Dr.Hopkins' ideal organ at this period — due allowance being made for the fact that its constitution had been arrived at after a series of rebuilds, at each of which a great deal had been preserved which less reverent hands would have thoughtlessly condemned."

Hopkins' views on organ-design must always be examined with respect, for his experience in these things was far wider than that of his contemporaries. He was not hidebound or insular, as his championing of Schulze has shown; and during his 83-year lifetime, coinciding almost exactly with all the revolutionary improvements which these pages have described and which, partly through his agency,

1. Andrew Freeman, Org.3.70.

enabled the instrument he loved to make three hundred years' progress in the course of less than a single century, he kept pace with every development and never allowed his judgement to stagnate, nor did he ever condemn any innovation simply and solely on the grounds of its novelty. More often than not, he was ahead of his colleagues in pressing for reforms whose necessity seems obvious to us, but which would have come about much later than they did, had it not been for the efforts of men like Hopkins. We have chided him in earlier pages 1) for his support of the hybrid choir, and called him a "child of his time" for the views he expressed in the fifties. But, more than forty years later, we find him to be partly concerned, with Alfred Hollins, in the design of Lewis' Southwark Cathedral organ, which included one of the most perfect examples ever made in Britain of the true "Choir-Positiv" department. Hopkins' views on the planning of the Great are well shown in his own organ at the Temple; although the Swell and Pedal were considerably enlarged in 1878 and a completely new Solo added at the same time, the Great and Choir were left exactly in their 1862 tonal condition. Nor was any change made in 1896, when various small improvements and alterations were carried out by Norman and Beard under Hopkins' supervision. Thus he remained faithful to the Schulze and Lewis ideals, and for forty years retained his Great as a sixteen-stop department of thirteen flues, culminating in eight

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1. vide supra, pp. 87-8.

ranks of mixtures, with three light-pressure reeds (two unisons and a 4ft).

The Southwark Great had a twelve-stop flue-chorus, with a string double as well as a bourdon, nine mixture-ranks and a single light trumpet; indeed, the entire organ was on $3\frac{1}{2}$ inches of wind, except for the two Solo reeds on 12 inches. Hopkins wrote at the time:

1) "We are very glad also to see that a return is being made to the custom of employing one weight of wind only for an entire and large organ, in this case excepting No.46 and 47. It has been so clearly shown of recent years (by improved methods of voicing, etc.) that 'the trebles' can be kept 'well up' when required, that there really no longer exists any necessity for encouraging the supposition that the voicer is dependent on a heavily-weighted bellows for such a result."

Whether or not the modern reader agrees with the single-pressure idea, the fact remains that Hopkins gave his firm and consistent support to that "school" of tonal design which produced some of the most magnificent Great-organ choruses of the century: and the perfection of Lewis' Southwark scheme is underlined by the fact that, when this organ came to be rebuilt and modernised in 1952 by the grandson of Lewis' old rival, Father Willis, the specification of the Great was left entirely untouched and still on uniformly light pressure.

1. "Organist and Choirmaster", June 1896.

in fact, throughout the organ, Henry Willis III kept the pressures at a remarkably low level for a modern instrument in a large cathedral (from $3\frac{1}{2}$ to 6 inches), with the same maximum as Lewis had observed -- 12 inches.

There were some other outstanding Greats dating from this final quarter-century, which must be given at least slight mention in passing, if only to confirm once and for all the fact that the Great had settled itself, well before the turn of the century, into a general shape upon which no very radical alterations seem to have been made, or even thought desirable, in the years that have elapsed since then. It will be observed also that provincial firms, of much less fame and material resources than the great craftsmen already mentioned, are showing themselves increasingly capable of making splendid instruments, on a large scale, whenever the opportunity is offered to them.

Chester Cathedral, for instance, in 1876 had a completely new organ built by the little-known local firm of Whiteley, whose claims to the contract were strongly supported by the recommendation of Dr. G.A.Audsley. There were seventeen stops on the Great; and the flue-chorus began with three doubles (diapason, string and flute) and went on through five unisons up to nine ranks of mixtures, with complete reed chorus -- a fine, spacious design on real "cathedral" lines.

Telford of Dublin has already made an honourable appearance in these pages: and in 1882 he provided St.Patrick's Cathedral in his own city with one of his finest organs, on which the eleven-stop Great contained no less than three compound stops, totalling ten ranks of mixtures, with a trio of heavy-pressure reeds. Eight years further on, Southwell Cathedral's new instrument was the masterpiece of the Bishop firm, whose founder will be remembered for the prominent part he played in the first half of the century. The Southwell Great, of thirteen stops, had no extraordinary features; but the very fact that such a department -- with complete 16ft-to-four-rank flues and 16-8-4ft reeds -- can be thus categorised in 1890 is in itself a very heartening indication of the progress that organ-design had made.

One last provincial example takes us back again to Leeds Parish Church in the year 1899, where the famous Hill and Schulze organ of 1859 was rebuilt and enlarged "forty years on" by the rising Leeds firm of Abbott and Smith. The Great was increased from 15 to 21 stops, and the additions are interesting to observe: 32ft sub-bourdon, 8ft gamba, salicional and hohl flöte, 4ft octave, and 8ft possaune on 7-inch wind. Thus the fluework now numbered sixteen stops, from 32ft up to eight ranks, and the original 16-8-8-4ft reeds remained on the same light pressure as the flues, with only the new reed on heavier wind.

There are others -- very many others -- who might be mentioned in this period of steadily-growing activity in the organ-builder's craft; some of them will be referred to in other parts of this

PLATE XIV.

Hope-Jones at his Birkenhead
console.

The first rebuild and electrification of the organ in St.John's, Birkenhead, was carried out in 1887 by Hope-Jones with the help of his choir-members; and the movable console which is shown here (placed outside the west door of the church -- though the reader will realise that this was not its normal position !) was one of the novelties that attracted thousands of organists and organ-enthusiasts to visit this famous instrument. The extremely "stream-lined" effect of the console is noticeable, emphasising how compact the new mechanism was.

(Photograph from an old pamphlet of the Hope-Jones Company, reproduced in Org.16.221) chapter, but those who are omitted will find their place in the more complete list of organ-builders which forms an Appendix to the first part of this work, from pages 471 to 515.

As for compass, little remains but to bring the century to a happy ending. The CC compass reigned supreme, with the solitary exception, at the very beginning of this final period, of Exeter Cathedral in 1876, where for reasons best known to themselves Messrs. Speechley retained the old "long-octave" GG compass on the Great (with GG sharp missing) although they at the same time shortened the Choir and lengthened the Swell to CC in both cases. Perhaps the explanation lay with Ouseley, who was directing the rebuild.

The upward range was gradually being extended, particularly on concert instruments. The CC-F 54-note compass almost disappeared, and CC-A (58 notes) was used much more often, though CC-G was the most common. During the nineties, however, both CC-A and CC-C (5 octaves) gained greatly in favour, with the latter becoming almost as popular as the former. For the sake of comparison with the percentages given on page 1[illegible]2 for the third quarter-century, the figures for the final period were as follows:

CC-A, 40%. CC-C, 35%. CC-G, 23%. CC-F, 2%.

The Swell Organ.

The previously-noticed uncertainty about the Swell's function was gradually fading during the closing stages of the century, and its new tonal characteristics were emerging with increased clarity. New organs were at last moving away from the days when the Swell was little more than an enclosed light Great; and the English Swell had now fully come into being. The adjective is justly applied to this department, for the Swell was, in its origin and in the line of development it followed, completely English; whereas Great, Choir and Pedal owed much to foreign influences, the Swell and Solo had no such continental antecedents.

William Hill may be said to have begun the Swell's process of evolution when he introduced heavy-pressure reeds; but although these "railway tubes" were first attached to the Swell keyboard, they were in no sense of the word chorus-reeds, nor is there any indication that Hill thought of them other than as Solo stops. It was Willis who, by his adoption of heavier wind for his chorus reeds, gave the Swell that character and personality which we have come to regard as one of the most glorious features of the organ. During the forties, as a glance at the specifications on pages 148 to 156 will show, several organs were built by Hill and others which on paper have a close resemblance to the "true Swell": reed-chorus complete from 16 to 4ft, flue-chorus from 16ft up to mixture. But, vastly improved as these designs were in comparison with the Swell of ten or twenty years earlier, yet the real effect was not yet there: the centre of gravity was still on the side of the flues, and so it remained until Willis' efforts began to make themselves felt.

During the fifties and sixties there was little change in the general position; Willis had no imitators in his use of heavier wind for the reed chorus -- nor indeed were there yet any other men with either sufficient skill or sufficient experience in this direction to reproduce the effects achieved by Henry and George Willis. Their very large organs, such as St.George's Hall and the Alexandra Palace, could not really exercise much influence on the everyday world of organ-building. Their size was bound to place them on a different level, almost in a different world, from that with which all those builders and organists were dealing who no doubt flocked to listen in admiration and awe to the marvellous tones of a Swell containing twenty-five stops; and who then returned home to their problems of doing the best they could with ten or twelve.

Rather was it from Swells like Winchester (13 stops) and Wells (10 stops) that an example was to be drawn; and perhaps these instruments were too remote from the big centres of population for their influence to spread very far. If any one particular organ could be described as the point of departure in the organ-building world's approach to the new Swell, it must be that of St.Paul's Cathedral in 1872, which ushered in the events now to be discussed.

Two symptoms must be looked for in order to discern any change in what has just been referred to as the Swell's "centre of gravity".

The first is the relative importance ascribed to flue or reed choruses in the tonal plan; that is to say, if both choruses are complete, well and good: but what if there has to be a choice between completing the one or the other ? Modern designers at once would answer "reeds"; a century ago, the response would not have been so unanimous and unhesitating. It is the shifting of the point of view from one opinion to the other that really epitomises the development of the Swell during the intervening period; and it is the presence of the 16ft stop that most clearly shows which decision has been made. For instance, if a Swell has only one double, and that one a reed, then the choice has been rightly made, and the centre of gravity has moved across to the side of the reeds. But as long as designers preferred to build up a complete series of flues from 16ft to mixture, while being content with reeds at unison,or unison and octave,pitch only, so long did they demonstrate that their verdict was given to the flues.

The second factor which can be taken as symptomatic of a change of outlook is the application of heavy wind to the reeds. The Swell, in those instruments where this had been done, was now envisaged as a primarily reed ensemble, just as the Great was a primarily diapason ensemble; and it was not so much the greater power imparted by the heavier wind that made all the difference, but the better, purer, more regular tone-quality that enabled the reed-chorus to play a foundational role and to dominate the lighter tones of the fluework -- in which department there had been comparatively little change since before the mid-century.

Two examples of enlightened thinking, illustrative of the
1) first symptom, have already been given passing mention in Chapter Three; but they were then so far ahead of their time, so completely out of their contemporary context, that they belong more properly to this later period -- in fact, neither design would be considered anything but progressive even to-day. Willis' two-manual organ, to Best's
2) design, at Wallasey is well-known and often quoted, doubtless because of the eminent names associated with it; and it certainly was a very "forward-looking" Swell. Strange that Willis, the apostle of heavy wind for chorus-reeds, should have placed these specimens on light wind; though admittedly Willis was still in the experimental stage of his career in 1861. What he had done in St. George's Hall or in Winchester Cathedral or at Wells might not, he perhaps reflected, be equally effective in a modest parish church.

Wallasey, however, remarkable as it was, had an even more remarkable and much less famous predecessor. Four years earlier, the almost unknown builder John Squire had installed an organ in Craven Chapel, near Regent Street in the West End of London; he had designed his Swell to have a CC compass -- in itself a praiseworthy feature in an organ of secondary importance at that date -- and had given it the specification which follows, in the year 1857:

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1. vide supra, pp. 204-5.

2. Specification given on p.297.

Open diapason	8ft	Contra fagotto	16ft
Stopped diapason	8ft	Cornopean	8ft
Principal	4ft	Oboe	8ft
Cornet	III	Clarion	4ft

Even to-day, such a design for a small Swell would be loudly commended as the most intelligent and effective possible use of eight stops: and the only way in which it could be improved would be, of course, by placing the fagotto, cornopean and clarion on heavier wind.

A glance back at page 206 will remind the reader of the summarised state of the Swell between 1851 and 1875, when the reed-chorus was complete in about one-third of the new organs of the period, and another one-third was complete as to its flues only. The comparative figures for this final quarter of the century are an encouraging indication of progress. The reed-chorus is complete (i.e. 16-8-4ft almost invariably, but 16-8ft examples are included as they are pointing in the right direction) in 54% of organs -- subdivided into 45% with flues complete and 9% lacking flue double or mixture or both. There remain 36% with flues "all present" but with a deficiency of reeds: and an unhappy 10% where neither kind of chorus exists at all. (One wonders what exactly was the aim and object of a builder in planning such an anonymous, colourless Swell -- but there are still plenty of the sort being built in the nineteen-fifties, alas !)

The position by the end of the century, then, was a definite improvement on that of twenty-five years before: but the centre of gravity, though it was on the move, still remained on the flue side, which was complete in ninety per cent of instances, as against the reeds' fifty-four. Comparative figures for the twentieth century have not been calculated; in all probability, they would not show a tremendous increase in the proportion of full reed-choruses, though increase there undoubtedly would be. Certainly, the reeds will not have gained a majority even yet.

A propos of the figures which have been quoted, it must be stressed that the organs on which they are based do not pretend to make up an all-inclusive list; those of the average village-church type have been omitted (with a handful of exceptions), as they in no way reflect the general progress of organ-building in their time -- rather do they lag several decades behind. It is the instruments of at least moderate, and more than moderate, significance that have been taken into account (to a very thorough extent, it may be said); instruments to which their builders may be expected to have devoted a measure of individual interest and care, and on which they cannot object to being judged by posterity.

The St.Paul's Cathedral Swell contained twelve stops: eight flues and four reeds; and it was on this design that Willis based the best of his Swell departments, with individual slight variations, from that time forward. His reed group usually consisted of five stops: oboe and vox humana on the same light pressure as the flues, and the trio of 16, 8 and 4ft chorus-reeds on heavier wind. The word "heavier" must be somewhat qualified, however, in regard to the 16ft stop, for about two-thirds of Willis' double reeds on the Swell were of the hautboy or fagotto variety and were on the lighter flue-wind of 3 or 4 inches — the other chorus-reeds were normally on 7 to 9 inches.

Willis began to use a Posaune or Trumpet double reed, on heavy wind, more often in the eighties, as if he were gradually becoming alive to its importance in the ensemble. After 1890, the 16ft reed was invariably placed on the heavy-wind soundboard, with the single exception of Exeter in 1891. It was noticeable that, as the 16ft heavy reed became a standard part of the Swell, it tended often to be omitted from the Great in organs of the 35 to 40 stop category, which still retained their 8ft and 4ft reeds on the latter manual.

As the emphasis shifted more and more onto the Swell's heavy-wind trio of reeds, so too did the importance of the fluework become less and less significant in the full Swell. At St.Paul's, for instance, the fluework from 16ft up as far as the 4ft, beautiful though
1) it was and is in itself, plays little or no part in the full. And wherever the Swell reeds are on heavy wind, the same effect occurs. As a result, the Swell has come to be built up principally round the flue upperwork and the reed-chorus. A "full Swell" thumb piston will rarely push out every stop in the department, or even three-quarters of them; the best result is more often given by about five stops

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1. The present tense can be used here, because the St.Paul's Swell of to-day is practically as it was in 1872.

only, no matter how big the Swell itself may be: 2ft, mixture, and chorus-reeds. Indeed, in many organs where the reeds are real "thoroughbreds", splendid results can be obtained from mixture and double reed only, with or without the help of the octave coupler.

A particularly famous example of this five-stop full-Swell is found in one of Willis' very last organs, at St.Bees Priory in 1899, where the Swell was planned to have eleven stops originally -- six flues and five reeds, both choruses complete and with heavy wind for the three chorus-reeds. But the 16ft lieblich bourdon was left "prepared for" and has so remained ever since, for it was found that the Swell was well-nigh perfect as it stood; it simply was not worth adding the bourdon. Much later it was even suggested that the vacant bourdon slide could be better filled by a second 16ft reed, of the oboe type so as to give an alternative light-pressure Swell ensemble.

Colonel George Dixon

1) a personal friend of Willis' last years, and one who knew organs in general and that of St.Bees in particular much better than most men, has written:

"In the original scheme for the Swell (of St.Bees) a light pressure Contra Fagotto, as at Wallasey, was proposed; but Willis himself strongly urged the advantages of the heavy pressure Contra Posaune. After hearing St.Alban's, Holborn, this was agreed to; and that the decision was right has been proved up to the hilt. Here the essential foundation of the modern Swell, first adumbrated

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1. George Dixon, in Org.20.176.

at St.Paul's, emerged fully developed in the splendour of modern heavy pressure reed work. This five-stop Swell has long been famous, and it is the only combination in the organ that has never been reset — because it cannot be improved............

"When it was finished, Willis himself declared it to be the finest 16ft manual reed on 7inch wind which had ever emanated from his works..........After Willis' day, Mr.Arthur Harrison, inspired by St.Bees, took up the idea of making heavy pressure chorus reeds the foundation of the Swell tonal structure and inserting the 16ft reed as its first double........"

Of the Swell fluework in general, there is not a great deal that needs to be said. On Willis' more important instruments, the flue chorus consisted of eight to ten stops (never more in this period). The double was often, but not always, a lieblich bourdon; but his finest Swells had either a double open (as at Lincoln), a contra gamba (as at Hereford) or a geigen principal (as at Coventry and Truro). Unison stops generally numbered four — open diapason, flute, salicional or else a more string-toned stop such as the viol d'amour at Durham and the echo gamba at Coventry and Truro, and fourthly the vox angelica. Upperwork comprised gemshorn, or principal, or geigen principal as its main 4ft stop; if there was a second, it was a lieblich flute. The 2ft was almost always a flageolet, except where the stronger fifteenth was used in the largest Swells; and the mixture — never more than one — was invariably of three ranks.

It is worth noting that Willis was on several occasions at pains to provide a complete flue-chorus of even as few as five stops; examples were at the Sheldonian Theatre, Oxford, in 1877, with flues of the pattern 16,8,8,4,V (observe the size of this mixture); and barely two hundred yards away at Wadham College in 1886, where the scheme was similar but with a three-rank mixture. The Sheldonian reeds were 8ft and 4ft, and Wadham's unison only.

Although lack of space might be pleaded in answer to the suggestion that a double reed would have made the Swell much better than the bourdon did, the far more likely deduction is that Willis did not make up his mind finally and confidently about the reed-foundational nature of the Swell until the nineties were well advanced. Even as late as 1886, and despite his Wallasey design of twenty-five years earlier, he still seemed to feel himself bound to instal the bourdon as the first double. One might presume that, after all, the real moving spirit behind the Wallasey scheme was Best, and that it is he who deserves the credit for giving priority to the double reed. But, if this were so (and it is mere conjecture), then Best had certainly swerved from the path of rectitude when he designed Bolton's Town Hall organ without a Swell reed-double in 1874, and explained its absence by the remark that the Sub-octave coupler would do just as well ! (Incredible as it may seem, that actually was stated in the booklet issued at the organ's inauguration, and beyond any doubt written by

1) Best himself: "......the coupler marked 'Swell suboctave on its own keyboard' largely obviates the necessity for a double reed......."

Willis never included more than one unison chorus-reed (never, that is to say, except on his out-of-the-ordinary instruments of the Alexandra Palace category) and he aimed at producing from the Swell reeds a tone that would contrast with those on the Great -- tone that was more fiery, more brilliant, more "free", while the Great reeds were to be smoother and more refined. That was the intention which was revealed clearly enough in his later work, and which the Harrison firm has emphasised still more with its Great organ trombas and its Swell trumpets of the present century.

As far as other builders were concerned, awareness of the importance of the Swell's reed-foundation seemed to be gradually growing in the minds of the more progressive among them. Records of wind-pressures are not as copious as they might be, even among organs dating from the end of the nineteenth century. Many writers are content to give merely a list of stops to represent a so-called specification, as if the pressure of wind were an unimportant technicality: whereas the whole complexion of an organ varies tremendously, according to whether or not the reeds are on heavier pressure than the flues. But sufficient information has nevertheless survived to give an adequate picture of the developing Swell.

The firm of Hill was responsible for a fine series of Swells

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1. Booklet issued in 1874 by the Bolton "Daily Chronicle", quoted in Org.8.178.

towards the close of the century; and, as befitted the pioneers of heavy pressure, they did not neglect that aspect of the design. For instance, in 1884 they rebuilt Holdich's famous Lichfield organ, and placed all five Swell reeds (including the usually light-pressure Hautboy and Vox humana) on heavy wind, though the exact pressure is not mentioned. Yet in the same year, Hill's Westminster Abbey rebuild had the Great and Pedal reeds on heavy wind but those of the Swell on light — a curiously radical diversity of treatment between two important Swells of similar size. In 1885, the seventeen-stop Swell at Beverley Minster, with two unison chorus reeds (a feature of several of the larger Hill Swells) was entirely on the light pressure of three inches; and in 1889 at King's College, Cambridge, the same procedure was followed as at Westminster— heavy pressure for Great and Pedal reeds, but not for the Swell.

However, during the nineties, heavier wind became more common on Hill's Swells; Birmingham Town Hall in 1890 had its reeds on 5inches as against the 3inches of the flues; in 1894 the Westminster Swell reeds were transferred on to a separate heavy-wind soundboard; and the new Peterborough Cathedral organ had its reeds similarly treated in 1894 also.

Walker was using heavy reeds by the late eighties; St.Mary's, Portsea, had six inches of wind (1889), Holy Trinity, Sloane Street had 5½ (1891), and St.Matthew's, Northampton had 6½ (1895). These were not overpoweringly high pressures, but they were quite sufficient to increase the proportion of reed tone considerably in the ensemble, as well as improving its quality. It is interesting to observe how Walker, one of the leaders of the "flue faction", became a whole-hearted supporter of heavier reeds as time went on. There was no anomaly involved in this, no change-of-heart: Walker clearly realised that Great and Swell must be widely and distinctly seperated in quality and character, and this aim would be realised all the more effectively by regarding the Swell's foundation as being the reed-chorus, in contrast to his own magnificent diapasons on the Great.

It might be contended that the increasing of the Swell reeds' wind-pressure was no more than a step taken in conformity with a similar increase on the Great: and that the result, instead of being contrast and tonal separation, would bring the Swell much nearer to its old "secondary Great" character. This theory, however, is soon disproved by an examination of the Swell's fluework, which was tending to bear less and less resemblance to a light Great: the upperwork, and especially the mixture, was being kept on the bright side: quiet strings and flutes were appearing more frequently than diapasons: and the realisation was spreading that the main Swell foundational-group was the reed-chorus, and so it was to the reeds that the higher ranks of harmonics truly belonged.

A few scattered examples by other builders may be mentioned here, to illustrate how the new gospel of reed-dominance on the Swell was gaining converts in all parts of the kingdom. There was, for instance, the organ built for the Inventions Exhibition in 1885 by the partnership of Michell and Thynne; this instrument shortly afterwards found its way, through the agency of a donor whose name it still bears, to Tewkesbury Abbey, where it has recently been incorporated with its historic colleague the "Milton" organ in one of the largest and most brilliantly-planned reconstructions ever carried out in Britain. This "Grove" organ of Michell and Thynne might perhaps have been mentioned in the "Great Organ" part of this chapter, but it can with equal profit be described here, for it was one of the first to show the possibilities of combining a brilliant diapason-chorus of the Schulze-Lewis type with heavy-pressure reeds of the Willis type -- the mixture on the Great, of four ranks, was placed on the same pressure as the reeds -- six inches. The Swell had its reeds on seven inches, and the flue-work was very mild and "old-world", except for the two string stops, Viole de gambe and Voix celestes. These were the work of Thynne, a remarkable voicer who introduced what may be called "modern string tone" for the first time in this organ, with other examples on the Choir and Solo. These stops had pipes of very small scale indeed, and very successful specimens with even smaller scales were produced later by Hope-Jones.

Thynne's string stops appeared again in a number of organs by

the partnership of Beale and Thynne in the nineties; the firm of Michell and Thynne had, sad to relate, suffered bankruptcy through their Exhibition organ, on which their financial loss had been £2,000. Notable organs by Beale and Thynne were installed in St.John's, Richmond (1896) and Holy Trinity, Upper Tooting (1898). Heavy-pressure reeds were adopted as standard practice in all their organs, and the string "flavouring" was very strong in all their fluework. Thynne, in-
1) cidentally, had been Lewis' head voicer for a number of years.

Further Swells that showed enterprise on the part of their various builders must be reviewed briefly. That of Bishop at Southwell Cathedral in 1890 was well-endowed with soft quasi-string tone (viola, vox angelica and celeste) and the chorus of reeds, on six inches of wind, included two unisons. The firm can hardly have made a vast profit out of this instrument -- a 54-stop 4-manual for £2,000; but costs in Victorian times were low, and prices in the organ-building business tended to be kept to the minimum by the intense competition.

Prices, indeed, seemed to vary and fluctuate within very wide limits at this period, as the following examples illustrate. All of them were completely new organs, or else thoroughgoing rebuilds with very little old material re-used:-

2) Worcester Cathedral (Hill, 1874), 55 stops: £10,000
Salisbury Cathedral (Willis, 1876), 55 stops: £3,500

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1. Alfred Hollins, "A blind musician looks back", p.150
2. Most of these prices are given by Henry Willis in his correspondence concerning the proposed Westminster Abbey organ (org.23.172)

Then, moving nearly a quarter-century onward:-

Middlesbrough Town Hall (Hill, 1898), 52 stops: £2,500
Norwich Cathedral (Norman & Beard, 1899), 64 stops: £6,432

And, retracing our steps to the two giants:-

Royal Albert Hall (Willis, 1872), 111 stops: £8,000
Sydney Town Hall (Hill, 1890): variously quoted as 126 stops: £15,000 and £16,300.

Thus it will be seen that the average price per stop (and it is speaking stops that are referred to here) varied by a hundred per cent and more, not simply over the entire thirty years, but as between organs built within a year or two of each other. In any case, Bishop's Southwell instrument was the cheapest of all.

In 1897, Forster and Andrews at St. George's, Stockport, had their Swell reeds on seven inches of wind, while the rest of the organ, including the Great and Pedal reeds, did not exceed four inches. At Chelmsford in 1899, Norman and Beard applied heavier wind -- six inches -- not only to their chorus-reeds but also to the Swell open diapason. This experimental move, presumably made with a view to increasing the weight of the fluework, was a step that led nowhere; the true character of the Swell was, by the end of the century, sufficiently established among the leaders and the more progressive second-rankers of the industry (organ-building was now too widespread and mechanised to be called a craft any longer) for its future development to lead safely in the right direction.

The little Wiltshire town of Calne is celebrated for its pork pies and its sausages; but among organ-lovers it has another claim to fame, in its possession of two admirable five-manual organs by the Huddersfield firm of Conacher. There is, of course, a connecting link between the two sides of Calne's culture, in the person of Mr. Harris himself, the founder of the famous firm and liberal benefactor in his own neighbourhood. The first of the two Conacher organs was erected in his residence, "Castle House", in 1896, and was a very progressive piece of planning in all its departments. The Swell, in particular, provided one of the very rare nineteenth-century instances of the reed double's being preferred to the flue -- in fact, as we have seen, the only others were Wallasey, Craven Chapel and St.Bees. The Calne Swell comprised the following registers, in outline:

8, 8, 8, 4, III, 16, 8, 8.

Though there were no heavy-pressure stops in this department, yet the reed-chorus definitely had the upper hand in the ensemble. The quite remarkable nature of this Swell design, in relation to that of its contemporaries, deserves more recognition than has hitherto been its lot.

Several leading builders adhered to light pressures to the end of the century; and though their Swells were sometimes large and were endowed with a well-varied selection of stops, the one prime essential was lacking which would have completed their tonal perfection. Lewis, of course, was not likely to be a convert; Abbott and Smith of Leeds built or rebuilt a splendid series of instruments, not by any means all in the North; Gray and Davison among the old firms and Hele among the new were both represented by some distinguished organs in the eighties and nineties. But the credit for establishing the Swell at the century's end according to the pattern which Willis had devised and developed, belonged not to such conservative elements, but rather to those men of advanced and adventurous outlook whose initiative has been described in the last few pages.

The Choir Organ.

In a century which has in nearly every department of the organ maintained a steady and continuous improvement, the Choir organ during this last twenty-five years comes as rather a disappointment. We have seen how there were reasons for encouragement during the period covered by Chapter Three; it really did appear as if an interest was being taken in it at last. The third quarter-century had shown so marked an advance on the second that there was every reason to look for still better things to come. Such hopes, alas, are swiftly dashed to the ground by a survey of the Choirs of this final period; not only did the looked-for progress not materialise -- there was even a decided retrogression. The Choir was doomed to remain in the doldrums for another twenty years and more: in fact, it is open to question whether it is not there still.

The first, and biggest, sign of deterioration was the virtual
1) disappearance of the mixture; the eighteen per cent of Chapter Three dwindled to a bare two per cent in the final quarter; among all the new or restored organs, only three new Choir mixtures appeared and two others were retained from before. The first newcomer was at Beverley Minster (Hill, 1885) which would have had an outstanding Choir but for the regrettable absence of a 16ft stop; the rest of the department was less "flutey" and more diapason-toned than was usual — in other words, nearer to the "positiv" pattern.

Then again, in 1890, Hill's Sydney Town Hall organ had a three-rank dulciana mixture (but it would have been very difficult to avoid inserting a mixture in a department of twenty stops !). Finally, in 1897 came what should have been the "Choir of the Century": Lewis' ten stops at Southwark Cathedral. On paper it seemed full of promise, and likely to prove a striking example of everything the late-nineteenth-century Choir should have been; but blend was the stumbling-block. The bright, silvery little chorus produced by salicional, salicet and mixture was spoiled by the family of lieblichs, whose tone was tame, uninteresting and lacking in colour — certainly not the best of which Lewis was capable in this direction. The critics united in regretting that the flue double was not a dulciana or a gamba, instead of a lieblich; and that the lieblichs were not voiced much more piquantly.

In the 1952 restoration by Henry Willis III, matters were some-

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1. vide supra, p.209.

what improved by the addition of independent nazard and tierce ranks and the removal of a surplus 4ft flute, but the Choir remained satisfactory rather than outstandingly good. These three organs apart, mixtures were retained in the rebuilt Temple Church organ by Forster and Andrews in 1878 and St. George's Hall, Liverpool (Willis, 1897), where the old four-rank mixture was reduced to three.

The fact that the mixture was more or less abandoned is a plain indication that any idea of the Choir's being considered as an ensemble was now at an end. Insofar as any coherent plan may be deduced from a survey of the instruments themselves, the Choir was in most cases predominantly a "flute" department; and there might be something to be said for this on the grounds of providing contrast with the diapasons of the Great and the more string-toned fluework of the Swell. In all but a handful of Choirs, the double was a Bourdon and the 2ft was a piccolo, thus colouring the whole department with a strong tinge of flute-tone, no matter what other stops might lie in between -- and there was no scarcity of flutes at the intervening pitches, either.

The Chester Cathedral organ, locally built by Whiteley in 1876, had a double dulciana as its Choir 16ft register; and by general consent in recent times this is the stop which forms the ideal sub-foundation for a Choir, as it contributes so much more to the chorus than a mere suboctave murmur which more often than not has a dulling and thickening effect. This Chester organ, which for its date was quite extraordinary in many ways, is a heartening proof of the growth and improving standards of an industry in which a hitherto little-known provincial firm could turn out something that, in size and quality, was equal to the best and, in intelligence of design, was better than most.

Another product of a local firm to break away from the Bourdon tradition was at Wakefield Cathedral where, after the latest reconstruction in 1879 by Kirkland, the Choir had a double open diapason. But both the origin and the ultimate fate of this stop are mysteries; it was not listed among the additions made by Kirkland, and it had disappeared (in favour of a Bourdon, naturally) in the 1902 rebuild.

Two Hill examples of an open double were at All Saints', Cheltenham in 1887 (where the 16ft viola was included in the enclosed portion of a "Choir and Solo" department) and in the Sydney organ. Willis' solitary instance was the 16ft dulciana at St.Peter's, Cranley Gardens in 1894. With these exceptions, the bourdon reigned supreme.

At the other end of the chorus, three builders ventured away from the piccolo. Several Hill organs, including Westminster Abbey and King's College, Cambridge, had a 2ft harmonic gemshorn; Walker also used this stop at Holy Trinity, Sloane Street and at St.Matthew's, Northampton. Hill occasionally used a fifteenth instead (as at Lichfield); Abbott and Smith did the same very sparingly during the nineties. Either of these divergencies from the prevailing bourdon-piccolo monopoly must have made a considerable difference to the ensemble; and the builders who thus displayed enterprise must have done so with a purpose; specifications are not drawn up by the pin-and-blindfold method. So it is somewhat odd that in only one organ were the two "heresies" perpetrated together; at All Saints', Cheltenham. But here the advantages to the chorus were nullified by the enclosure of the 16ft viola and 4ft salicet in a swell-box with the solo reeds, while the remaining 8ft and 4ft flues and the 2ft harmonic gemshorn were unenclosed; this department was a self-confessed hybrid in which the claims of the Solo took precedence over those of the Choir flue-chorus. (Incidentally, the flue double was removed sometime between 1896 and 1927.)

What was described on an earlier page as the "fatal fascination of the universal clarinet" continued unabated to the end of the century. In most Choirs, it was the only reed: and until the middle eighties it was almost invariably unenclosed. From then onwards, however, an increasing number of builders began to put either the whole department, or at least the reeds only, into a separate swell-box. Now in a three-manual, instead of having an unsuccessful mixed Choir-Solo standing on an open soundboard and failing to do either job properly, is it not clearly a sounder plan to separate the two sections and to enclose only the Solo stops ? That is what Hill had in mind at Cheltenham -- though he mismanaged it there -- and at St.Paul's, Vicarage

Gate, Kensington in 1890 and St.Magnus, London Bridge in 1891 (only one stop enclosed here -- an orchestral oboe) as also did Willis at St.Peter's, Cranley Gardens (1894) and Cirencester Parish Church (1896).

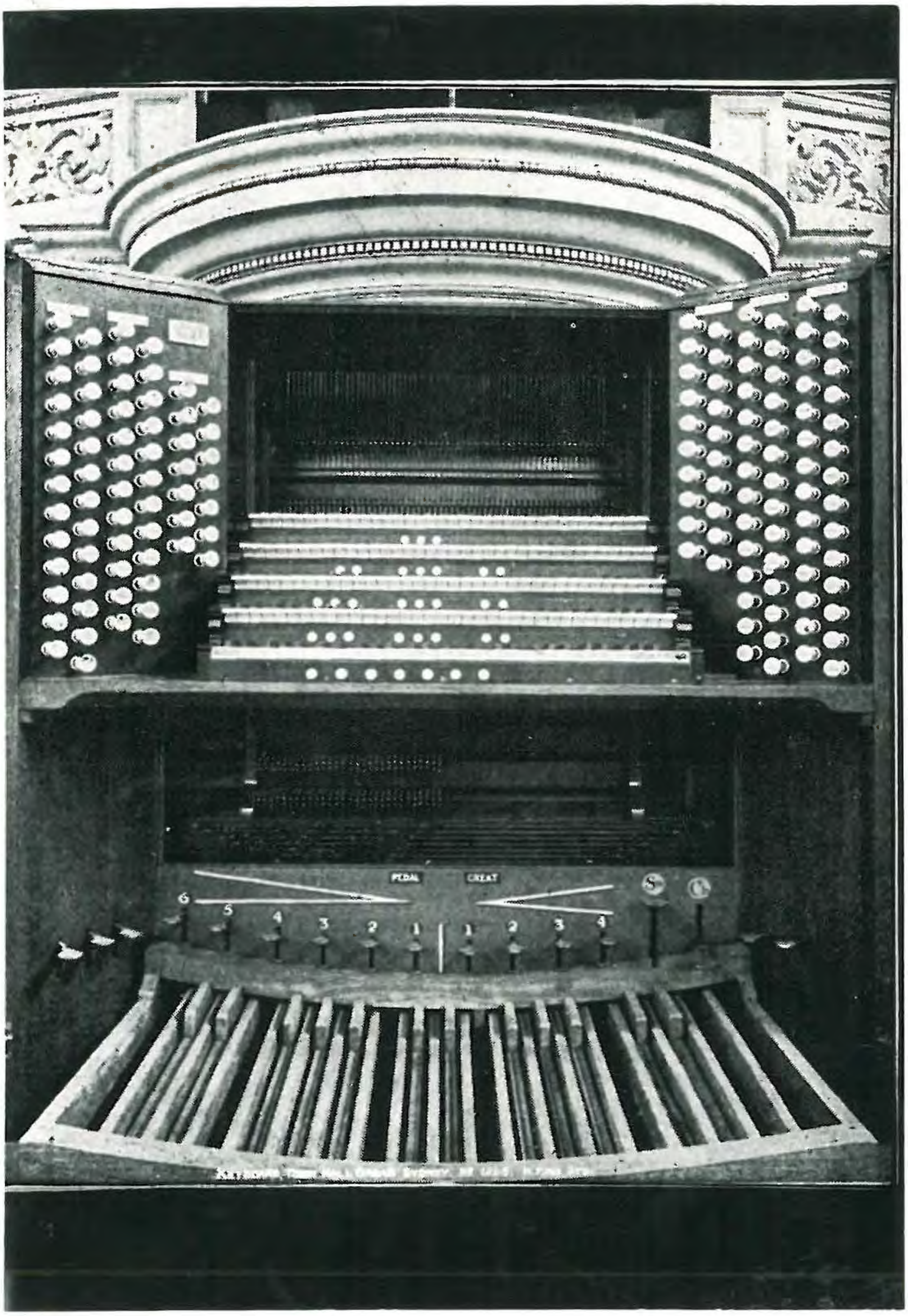
But what is one to make of such a procedure as Willis adopted at Exeter in 1891 ? His large and complete Solo organ of ten stops on the fourth manual was left completely unenclosed, while three solo reeds were tacked onto the Choir manual and enclosed in a box of their own. Odder still, both groups included a clarinet stop (though the Choir specimen was the broad-toned corno di bassetto while that on the Solo was orchestral).

Hill did likewise in his Sydney organ, where the twenty-stop Solo department was full of registers crying out in vain for enclosure; and it was the five Choir reeds which were the only enclosed stops, apart from the Swell, in this immense instrument. The logical use of enclosure was a lesson that the nineteenth century did not learn. The total-enclosure exponents of more recent times have opened our eyes to what can and what cannot be effectively boxed; and a sane compromise has at length been worked out.

In a number of Choirs, a 16ft reed of the Bassoon or Cor Anglais type was included; and as most of these occurred in four-manual organs, their presence on the Choir seems pointless. On the other hand, there were no Choir reeds at all in Eton College Chapel (Hill, 1885), St.Matthew's, Northampton (Walker, 1895) and at South-work (Lewis, 1897). This apparently unconventional step had every justification; the clarinet was located in its rightful place on the Solo manual, and the Choir fluework was freed from its association with a stop which did more harm than good in the ensemble.

Towards the end of the nineties, the Choir's role as an at least partially Solo department was confirmed by the presence of a tuba in several three-manual organs, of which St.Stephen's, Bournemouth (Hill, 1898) was one of the first at that period; the third manual at St. Bees Priory Church (Willis, 1899) was a completely Solo division and was so designated -- though it was not the first time Willis had omitted the Choir altogether. Over twenty years earlier, the third manual at the Sheldonian Theatre, Oxford, had in 1877 been designed and installed as a Solo organ of five stops, including a tuba.

As far as the Choir organ is concerned, then, the nineteenth century closes in an atmosphere of continued uncertainty among the more thoughtful builders, and of apparent contentment with the perfection of the late-Victorian Choir organ among the majority. The problems of the Choir could never be properly solved until designers asked themselves what they wished the Choir's function to be. The answer to that question will naturally vary according to whether or not there is a Solo manual. The awareness of this difference did not reveal itself in nineteenth-century Choir-organ design; the department preserved its same, conventional pattern in three-manual and four man-


PEDAL
GREAT
6 5 4 3 2 1
1 2 3 4

<u>PLATE XV.</u>

Sydney Town Hall: the console.

This photograph of the century's largest console (with the music-desk removed) shows the various controls clearly. The pedals immediately above the pedalboard are as follows, from left to right: three pedals for manual-to-Pedal couplers; six composition pedals for Pedal organ; four composition pedals for Great organ; tremulants for Swell and Choir; and "hitch-down" swell-pedals for the Swell and for the Choir reeds. The apparently parallel shape of the pedalboard is merely an optical illusion caused by the position of the camera; the pedals were, in fact, radiating and concave.

(Photograph from "The Organ and its Masters",
by Henry C. Lahee, page 208)

ual organs alike -- a basic fault revealing a lack of logical thought, such as contrasts sadly with the intelligence, ingenuity and initiative which was lavished upon every other aspect of organ-building.

The Solo Organ

The growing popularity of the Solo organ continued as the century went on; and in this final period, about one-third of the more important new instruments were designed with four manuals. There was no radical change in tonal make-up, except for the fact that enclosure was becoming more common; nor was there any increase in the average number of stops in the department beyond the level of about six: the great majority fell into the four-, five- or six-stop group, as before. On the whole, the more frequent use of this part of the organ led to a more consistent uniformity of design; such a trend was only to be expected in a manual containing so few stops, where certain basic tone-colours are demanded: harmonic flute, string, soft orchestral reed, heavy-pressure tuba.

Solo organs of only one or two stops became things of the past, with the exception of a few of Hope-Jones' organs: for instance, in Ambleside Parish Church (1898), the Choir was omitted and the top manual of the three contained only a tuba, reigning in glorious isolation on sixteen inches of wind. Then there were two examples of a three-stop Solo, by different builders and at different times, but curiously enough both in Windsor Castle: in the Royal Chapel itself (Gray and Davison 1882) and in the miniature four-manual serving both the Private Chapel and St.George's Hall (Willis, 1889). Both consisted of harmonic flute, orchestral oboe and tuba (in the latter, smaller building, a tromba). These organs apart, the normal Solo was equipped with a minimum of four stops and a maximum of eleven -- exceeded only once in this period, by the far from normal total of twenty stops in the Sydney organ.

1) In the late sixties and early seventies, as we have seen, the plan of the Solo department was settling down after twenty years of experiment. At St.Paul's Cathedral in 1872, Willis formulated the design which became his favourite: six stops, comprising 8ft and 4ft flutes, 8ft clarinet and orchestral oboe, 8ft and 4ft tubas. He used this identical scheme at Salisbury and Durham (1876) and at Canterbury (1886); without the 4ft tuba at the Sheldonian, Oxford (1877) and at Coventry and Truro (1887); and with two other stops added at Lincoln (1898). His few four-stop Solos omitted the 4ft tuba in every case, and one of the quiet reeds or the 4ft flute.

The reader will perhaps have observed the absence of ~~any of~~ any of the string tone which Willis had used in his largest Solo organs of the previous period. Such an omission is especially noticeable in these days when the strings are often designed as the found-

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1. vide supra, pp.219-20.

etional chorus of the Solo department (thus completing the tidy four-manual pattern based on the respective tone-colours of diapason, reed, flute and string). Willis certainly seems to have decided that string tone was not of high priority in a Solo of limited size; his only other use of it before the nineties occurred at St. Michael's College, Tenbury (1873), as was mentioned on page 290, and again in Huddersfield Town Hall in 1880 -- a gamba on both occasions.

It must be borne in mind that the Willis gamba was a very different affair from the keenly-voiced orchestral violas which we are accustomed to find on the Solo to-day. The first experiments in such stops were taking place during this final period: but the older gamba was

1) "of small scale and less powerful tone than the Diapason; it is voiced keen, i.e. with the upper partials prominently developed at the expense of the ground tone..........Of recent years the old colourless gambas, suggestive rather of Horn Diapasons, and usually attended by that disagreeable defect of speech known as 'spitting', have well-nigh disappeared. The introduction of keen, etherial string tones........constitutes one of the most remarkable developments of modern organ tone."

Thus Wedgwood in 1905; the old type of gamba was, in fact, well suited to the Swell or Choir, where it still plays a very valuable part, but it was not worth its place as a purely Solo stop.

Willis re-introduced the gamba, in conjunction with a 4ft

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1. Wedgwood, op.cit., p.78

viola, into his fourth manual at Exeter (1891), which besides being his largest Solo department in the last quarter-century -- ten stops -- was of a somewhat different design from his regular type. Eight of the stops were flues, from Dulciana 8ft to piccolo 2ft, looking more like a Choir than a Solo; and three quiet reeds had abandoned their proper place on the top manual in favour of enclosure in a special box attached to the Choir.

The last two of Father Willis' masterpieces, at Lincoln in 1898 and St. Bees in 1899, both included a gamba and a voix celeste. The former stop at St. Bees was named Viole d'amour, which is nothing more than an echo gamba; but a Bournemouth vicar once refused to permit Willis to insert it, as being highly unsuitable for a church organ. Willis simply changed the name of that particular stop to viola da gamba, but it was said that the vicar remained permanently suspicious that the Viol of love was lurking about somewhere. Among Willis' moderate-sized Solo organs, St. Bees was the only one to include a 16ft stop, a double salicional; here again, a chorus-effect was partly the motive behind this stop, for the manual -- despite its label of Solo -- must have been required for part-time duty as a Choir organ.

Among other builders, there was nowhere the same uniformity and sureness of pattern that characterised Willis' work. Hill was fairly consistent in specifying a gamba or similar stop, and sometimes added a piccolo or flageolet, e.g. Beverley Minster and Eton College (1885), Queen's Hall (1893) and Peterborough Cathedral (1894) Beverley had tubas at 16ft and 8ft pitches, as also did King's College, Cambridge in 1889; but neither Hill nor any other builder appeared to favour the 4ft tuba clarion which Willis used so often. Eton had the almost unique distinction of being without a tuba at all in its six-stop Solo. At King's there was also a second reed double, a Cormorne (i.e. clarinet), a type of stop that was more common on the Choir but much more logically located as Hill placed it, on the Solo.

The twenty-stop Solo in the Sydney Organ (Hill 1890) can be compared only with Willis' similarly-sized department of nearly twenty years earlier at the Royal Albert Hall. Sydney had eleven flue stops as against the Albert Hall's ten; but the latter scheme seems to have more variety from the Solo standpoint as well as more balance in ensemble, with its 16ft string stop and its bright cymbale mixture; and among the reeds, Willis' acknowledged superiority in the heavier stops was supplemented by his use of enclosure for the quieter orchestral reeds. Hill kept his entire Solo on open soundboards, but unaccountably chose to enclose the family of five reeds on the Choir.

The 1876 Chester Cathedral organ by Whiteley again deserves mention here for some unusual and ingenious features; its fourth manual was described as "Echo and Solo" and consisted of three groups of stops. Firstly there was a quiet flute-and-string group of seven stops from 16ft to 2ft, with a vox humana, all enclosed; then came an orchestral trumpet and a tuba mirabilis, both unenclosed; and thirdly, three stops duplexed from the Great -- diapason harmonic 8ft, harmonic flute 4ft and tromba 8ft.

Telford, at St.Patrick's Cathedral in Dublin (1882) also had an outstanding ten-stop solo; the five flues comprised a string gamba (a linguistic monstrosity -- "string leg", if it means anything at all), and flutes 8, 4 and 2ft, with a glockenspiel, which was a bright and high-pitched light mixture such as Hill later employed in the Echo divisions at Sydney and Westminster Abbey. Telford's five reeds at St.Patrick's included a 16ft contra fagotto as well as the usual 8ft stops (but as his Choir organ also had a 16ft bassoon and the inevitable clarinet, there was faulty and redundant design here).

The large Conacher five-manual chamber-organ at Calne (1896) contained the only British example in this period of a type of heavily-winded diapason invented in Germany, the Stentorphon, with its mouths extending half-way round the circumference of the pipes. This novelty did not gain many adherents, as it was found that a similar effect, with much better tone and more certainty of speech, could be produced by leathered diapasons, about which something was said on page 330. Two other unusual points at Calne were the two-rank celestes stop, in which the in-tune and out-of-tune ranks were drawn together (a similar procedure with two and sometimes three ranks was used by

Hope-Jones) and the little mixture, delightfully named Harmonia aetheris.

Hope-Jones introduced some novelties in his Solo departments at Worcester (1896) and the M'Ewan Hall, Edinburgh (1897); one of them, the diaphonic horn, was included in his Worcester specification but never installed: more will be said about diaphones in general, which made their first appearance on this organ, in the "Pedal Organ" section of this chapter. The diaphonic horn was an improved variety of diaphone which Hope-Jones patented in 1897 and used with success in some of his later organs, e.g. Burton-on-Trent Parish Church in 1899 and St. Clement's, Ilford in 1900. Its tone was that of a "very
1) powerful, full and rich Horn Diapason"; but it is generally agreed among the friends as well as the foes of Hope-Jones that such stops are better suited as lower-range stops on the Pedals.

Worcester had two types of tuba on the Solo: the normal tuba mirabilis, and a tuba sonora, "of very full, round and pure

2) tone, constructed with tongues of unusual thickness. The tone even appears hollow, suggestive of the Orchestral Horn......."

This stop was used again at Edinburgh, where the tuba mirabilis was one of the very few existing double-tongued reeds. In passing, the Worcester tuba mirabilis was originally intended to have spoken on a wind-pressure of 100 inches, but sanity prevailed, and a "mere" twenty-two inches was found sufficient. One of Hope-Jones' less succ-

1. Wedgwood, op.cit., p.54
2. ibidem., p.167

ful tonal experiments was the Kinura at Edinburgh, which he repeated on several other organs. Even Wedgwood cannot find a good word for it, describing it as "not impressive" and telling us that it has [1] been variously referred to as "resembling a badly-voiced oboe, a bee in a bottle, or even a concertina". One does not need to have heard the original stop to gain a perfect idea of its tone !

One of the most vitally useful improvements in the last two decades of the century was the increasing use of enclosure; the great majority of Solo departments from 1880 onwards were either totally or partially enclosed. Willis had paved the way at the Albert Hall by placing some of his soft imitative reeds in their own box, though he does not seem to have followed-up this brave beginning until seven years later (1879), at St. Mary's Cathedral, Edinburgh, where all the Solo stops were enclosed, except the Tuba. This became, and has since remained, the general practice; all the Solo flues and light reeds are normally enclosed, while the Tuba and any other heavy reeds remain in the open. Only rarely has a tuba been enclosed (though the reader will remember that the original York "railway tubas" were), and this is confirmed by modern usage. There is no doubt that tuba tone loses much of its splendour inside a box: it almost ceases to be tuba tone at all, becoming little more than a heavy-pressure chorus-reed. The true tuba effect demands the best and most open speaking-position for the pipes; many examples are so hemmed-in by other pipework that

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1. Wedgwood, op.cit., p.96

they might just as well be enclosed in a swell-box.

Hill at Peterborough (1894), Lewis at Southwark (1897) and Abbott and Smith at Leeds (1899) provided isolated instances of enclosed tubas. Willis made no exception to the rule -- Wedgwood is incorrect in stating that the tuba at St.Alban's, Holborn (1893) was enclosed. Hope-Jones was the only builder to make a general practice of enclosing his tubas: at Worcester and Edinburgh, the big tuba mirabilis stops were in the open, but the tuba sonora stops were enclosed with the rest of the Solo stops. The tuba which constituted the entire Solo department at Ambleside was included in the main Swell-box.

An outstanding early example of enclosure used on a more extensive scale than most of the other organs of its period was Lewis' rebuild of the organ in St.Andrew's Hall, Glasgow, to the design of Best and Smart in 1877. The seven-stop Solo had its own box, as also did two of the Choir stops: making, together with the Swell itself, no less than three swell-boxes in the organ. Small wonder that one of the greatest musicians of the day, from a country where the swell-box was almost unknown, should have been deeply stirred on hearing this instrument. This is what Hans von Bülow had to say after the opening recital:

1) "I never met with an organ so good in Germany, the instruments there not having the same amount of expression and flexibility -- most delicate and exquisite nuances -- that hearing the diminuendi

1. "Glasgow Herald", November 3, 1877

and crescendi was to me a new sensation. If I would longer listen to an organ like this, and a player like Mr. Best, I would, were I not grown too old, jeopardise my pianistical career and begin to study the organ, where certainly I would be able to display much more eloquence as Beethoven's and Chopin's speaker....."

One further exception to the normal use of the Solo box for most of the light flues and reeds, was the not inconsiderable number of cases where the vox humana alone was provided with a swell-box. This was symptomatic of the quite extraordinary fetish surrounding this stop towards the end of the nineteenth century. Tewkesbury Abbey (Michell and Thynne, 1885), St. Giles' Cathedral, Edinburgh (Harrison, 1887), Holy Trinity, Tooting (Beale and Thynne, 1898) were not by any means the only examples. There were many people for whom this quaint little stop was the most interesting and beautiful thing on the organ, imbued with a sentimental sanctity.

In a history of St. Mary's, Paddington, published in 1890, the writer proudly declared that the church's vox humana was considered by musical critics to be one of the finest in England. Radley's celebrated organ was enlarged by Walker in 1868 into a fine and complete four-manual of sixty stops -- but not complete enough for the Radleians, who soon complained of the absence of a vox humana. A large sum was collected, apparently without any difficulty, and the missing stop was obtained from Cavaillé-Coll. We are not told whether it travelled first-class from Paris; but on its arrival it was inserted in a special box inside the Swell-box, with its own private tremulant. It was declared a great success at its "opening" in 1872.

Finally, here is a quotation from the programme of Best's inaugural recital on the new organ in Newcastle Cathedral in 1891; the fourth item reads as follows:-

"Rêverie réligieuse on a theme by A.Adam. . . . . . Best
(the Vox Humana will first be heard in this movement)

The earlier items in this programme included Bach's "St.Ann" and Mendelssohn's fourth Sonata -- but obviously they were merely curtain-raisers, to which no-one paid much attention in their eagerness to hear the One and Only Stop.

The Echo Organ.

A small number of Echo organs made their appearance at this time, and they nearly all belonged to what might be termed the "Internal" or "German" type of Echo; the pipework was grouped with the rest of the instrument, and the Echo-effect was inherent in the choice and voicing of the stops rather than in their geographical location.

Chester Cathedral's combined Echo and Solo fourth manual has been mentioned already. In 1877, St.Martin's, Scarborough (Harrison) had a five-stop Echo in place of a Solo, including a stop whose name is reported as being "Omphiangelon". Neither a reasonably extensive knowledge of Greek nor a search through the pages of Liddell and Scott reveal anything more than a conviction that the stop must have been labelled "Amphiangelon", and was presumably a double-ranked stop of the celeste type. (Wedgwood, as he was inclined to do in some cases, ignored the very existence of the stop: its life was short, in any event, for the Harrison organ was completely rebuilt, and reduced drastically in size, by Willis, after only thirteen years of existence.)

Sydney Town Hall's fifth-manual Echo was an intriguing-looking little unenclosed chorus of seven flues, with a predominance of string tone and containing as many as eight mixture-ranks, together with a light chorus-reed; the effect must have been quite fairylike, and truly an Echo. Hereford (Willis, 1892) had both Solo and Echo on its fourth keyboard, but in this case the "Echo" was a misnomer; the six Echo stops were in reality enclosed Solo stops — including a Tromba on twenty inches of wind which, with the box open, could dominate the organ: some Echo ! When Willis' grandson restored the organ in the nineteen-thirties, the Echo disappeared and its stops were correctly assigned to the Solo division.

Two other "Internal" fifth-manual Echoes were found at Castle House, Calne (Conacher, 1896), where the five gentle voices were enclosed in their own box inside the main Swell-box; and at Leeds Parish Church (Abbott and Smith, 1899) with the unusually large number of twelve stops, complete from 16ft to two-rank mixture.

Nathaniel Holmes' organ at his Regent's Park house in 1875 had shown the way in which the new electric action could be used for the remote control of a distant Echo division; but it was twenty years before this idea was followed up. In Westminster Abbey in 1895 a Celestial Organ was placed in the triforium of the south transept, connected by electric cable to the console, two hundred and fifty feet away. This was no ordinary Echo organ; it comprised seventeen speaking stops (and a set of brass gongs) enclosed and divided into Solo and Accompanimental groups, either or both of which could be played from either or both of the fourth and fifth manuals. These Celestial stops and their couplers were operated by stop-keys placed above the left-hand drawstops.

Norwich Cathedral (Norman and Beard,1899) provides us with the second well-known example of this type of Echo. Here again, the pipes -- complete, of course, with their own separate blowing apparatus -- were in the triforium, at some distance from the console on the screen; and the association between Norman and Beard and Hope-Jones bore fruit in the electro-pneumatic action connecting the fifth manual to these twelve stops. It was still functioning well, up to the time when the main organ was partly destroyed by fire in 1938. This Echo at Norwich was not divided, as at Westminster; but it was a very complete chorus, with two 16ft stops and a lovely selection of flutes and strings, of which much of the pipework was of pure tin. Two reeds (vox humana and harmonic trumpet) completed the group, together with the seemingly statutory gongs. One wonders for what purpose these percussions were supplied to these two Cathedral instruments! surely Sir Frederick Bridge or Dr. Frank Bates were not in the habit of playing "The Bells of St. Mary's" as a voluntary after Evensong ? One account has been preserved of their use, however.

1) "At Christmas time, the late Sir Frederick Bridge used these gongs at Westminster Abbey with great artistry when improvising between the carols. One of his favourite combinations was gongs
2) together with the slowly undulating flauto unda maris (sic). The sound of the gongs faded away, leaving the unda maris sounding. To hear this effect descending from the triforium, about 300 feet from the console (and above the tomb of Handel) on such occasions, while the last rays of a winter's sun illumined the stained glass, was a pure joy. Possibly sentimental, yes, but sentiment in the correct place, and at the right time."

Both these Echo organs stand silent to-day, not having been restored or re-connected during the reconstructions of the nineteen-thirties. In these more austere twentieth-century times, such departments are regarded as luxuries, and money cannot be spared for something whose value is doubtful, whose appeal is sensational rather than musical, and whose place can nearly always be taken by Swell or Choir stops. However, the pipework remains in situ, and it is to be hoped

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1. Whitworth, "Organ Stops", p.91
2. It is not clear to what stop Mr. Whitworth is referring, as there is nothing of this name on the organ.

that one day these stops will again be made to speak: it is impossible to suppress a sneaking desire to hear those gongs.

The Pedal Organ.

As with other parts of the organ, there was no tremendous growth in size towards the end of the century. Best was fond of remarking "The days of monster organs are past. No instrument need have more than fifty stops. The varieties of organ tone are few, and their repetitions are simply a nuisance to the player." Certainly the number of "over-60-stop" organs built in the final quarter-century was less than half that of the previous quarter.

It was as if the instrument itself, having expanded out of all recognition in the space of barely fifty years, was now settling down to take stock of itself and to see what was good and what was bad in its constitution. Much that had happened in the crowded half-century since 1825 had been experimental, needing to be tested in the furnace of day-by-day use. Changes were bound to be necessary; and indeed, altogether new conceptions of tonal design lay ahead, just round the corner of the new century. The Victorians themselves were not blind to the fact that perfection was still a long way off; and it was particularly in the Pedal department -- that portion of the organ which in Britain had been practically non-existent two generations back -- that the weaknesses attendant upon too-rapid growth had to be faced.

One positive improvement, as the century ran its course, was the continued decrease in totally inadequate Pedal-organs of one or two stops only. One of the last flagrantly bad examples of an out-of-date design was in St. Mary's, Stafford, where the 1883 reconstruction by Banfield of Birmingham left the twenty-eight manual stops supported by a solitary rank of Open Pedal pipes. Fortunately this was an exceptional case; only the remoter village churches and the poorest parishes were as ill-equipped as this at the century's close.

The average Pedal organ showed no alteration in its size or appearance during the seventies or eighties; five was still the most common number of stops -- four flues and a reed. Yet, oddly enough, for one of his most important and in some ways most progressive organs, at Canterbury Cathedral in 1886, Willis used an even smaller Pedal section: four stops only -- to balance forty-three stops on the four manuals. This was an unusually meagre allotment in comparison with his other Cathedral instruments; for instance, Salisbury with 44 manual against 11 Pedal stops, Durham with 45 against 10 -- and these were ten years before Canterbury. It is not surprising that the earliest opportunity was taken (by Norman and Beard in 1902) to increase the size of this department by adding five more stops.

The disappearance of the mixture from all except a few of the largest Pedals of ten stops or more was regrettable, for this stop does undoubtedly give much-needed clarity to the reeds, and thus improves the attack in the more virile type of Pedal solo. Admittedly the mixture's inclusion may seem to aggravate the Pedal's main weakness in design -- that it bears relation to the Great alone; and it is agreed that the mixture does not help to remove this weakness. But it is a fact that, without these necessary upper harmonics and the consequent gain in brilliance and sharpness of outline which they impart, the Pedal cannot be said to fulfil properly even this limited role of supporting the Great. As we know to-day, it goes without saying -- and as we shall presently be reminded by the man who first propounded the doctrine, -- the Pedal's duty is to be planned in terms of every manual and every stop in the organ.

Willis seemed to change his policy on Pedal mixtures later in life. Until the early eighties, he used them regularly in his larger organs, such as Salisbury, Durham and Edinburgh (St.Mary's) Cathedrals, and Huddersfield Town Hall, as well as in some of more moderate size. New College, Oxford (1877) included a mixture among its six Pedal stops, and St.Dominic's Priory, Haverstock Hill (1883) had a mixture among only five stops. On the other hand, in that same year, the seven stops in Willis' Pedal at St.David's Cathedral were mixtureless; and from then onwards he seems to have practically abandoned the stop, with the solitary exception of St.Alban's, Holborn in 1893. Exeter, Coventry, Truro, Hereford and Lincoln were all of them the sort of building where full Pedal needs all the clarity that can possbly be given to it; but the anti-mixture movement apparently had its effects even upon Father Willis.

At Lincoln, however, he did supply a 4ft stop for the first time; this is a most valuable member of the Pedal department, as has been demonstrated in Germany and France for centuries. It appeared in a small number of British organs of the period, especially by Hill — Lichfield, Beverley, Sydney and Queen's Hall, for instance. In the seventies, there were two interesting and unusual Pedal departments containing both 4ft and 2ft stops: St. Martin's, Scarborough (Harrison, 1877) and the Temple Church (Forster and Andrews, 1878). The Scarborough organ, probably the first major instrument by this afterwards famous firm, displayed its' builders' strongly individual promise in the "Peds", as elsewhere. The thirteen Pedal stops comprised four unisons at 16ft, quint, three at 8ft, twelfth, fifteenth, twenty-second, and reeds 16ft and 8ft.

The Temple 4ft and 2ft stops were called "Tenor Solo" and "Treble Solo" respectively, and they very possible owed their origin
1) to Hopkins' interest in the "Canto fermo" coupler at Trinity College, Cambridge, by Gray in 1834; moreover, the manual-4ft-to-pedal coupler was rather more frequent about the middle of the nineteenth century than it is to-day. It is disturbingly typical of a certain kind of "modern" rebuild that, in 1910, the Temple organ was stripped of these two stops as well as the quint and twelfth, without anything being added in their place.

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1. vide supra, p.119.

The importance of the 32ft sub-foundation was maintained; and so necessary was it now being considered that methods were devised of producing a 32ft effect where either expense or lack of space (or both) made the full-length stops impossible. These "acoustic" or "resultant" stops were no novelty on the organ, for they had been introduced by the Abbé Vogler at the end of the eighteenth century as part of his "simplification system". Since the eighteen-forties, the quint 10 2/3ft had often been included among the Pedal stops for this very purpose of evoking a suggestion of 32ft tone when combined with the 16ft flues; for theoretically the simultaneous sounding of one note with another a fifth higher will produce tone an octave below the lower of the two.

For example, CCC will normally have 32 vibrations per second, and the G above will have 48; thus every second vibration of the C will coincide with every third vibration of the G, and this will happen sixteen times every second. These coincident, reinforced vibrations thus simulate tone with a frequency of 16 vibrations per second, that is to say, CCCC 32ft.

This type of stop can never be regarded as more than a substitute for the genuine article; some examples have been much more successful than others, but even the best of them can in most cases be effectively used only in combination with other stops; when they are heard by themselves, the quint rank is too strongly apparent.

One of the first organs to have an acoustic 32ft was Michell and Thynne's at Tewkesbury (originally built, as will be remembered, for the 1885 Inventions Exhibition). This took the form of the main open-wood stop, the great bass, quinted upon itself in the lowest octave, and with its bottom eighteen pipes borrowed to form the top eighteen at 32ft pitch. The Abbey organist reported, sixty years afterwards: "......while some notes are bad -- and one or two even vile -- an occasional note here and there has the profound mystery of the real thing."

This method of quinting in only the lowest octave and borrowing the remainder was advocated especially by Thomas Casson, who stressed that the quint became more pronounced and the resultant tone less so as the pitch rose. That was the weakness of having an independent quint rank; it was of little value for more than half its compass, and so the advent of tubular and electro-pneumatic actions made it feasible to obtain much better results with only twelve of the quint pipes. The 32ft stop could now be produced entirely from existing pipework, indeed, if the quints were taken from the bourdon rank; it was soon found that the best results came from combining diapason fundamental tone with bourdon quints -- quinting "like with like" was never as satisfactory.

The Tewkesbury stop found an imitator four years later in the organ at the Wesley Chapel, Frome (1889), rebuilt by a local builder, W.J. Grant, who modelled his "Harmonic bass" directly on that of Michell and Thynne. The epithet "harmonic" for stops of this type is not to be recommended, and in practice they soon began to be more often named "acoustic" or "resultant". The word harmonic already had its own especial meaning when applied to the organ -- the system of tone-production from pierced double-length pipes which Cavaille-Coll had invented and which was so frequently applied to flute and reed stops in Britain.

Hope-Jones made free use of acoustic 32ft basses; and he was able to go further still at Worcester in 1896. Finding two full-length 32ft diapasons already present in the Hill organ which he was reconstructing, he produced a resultant 64ft stop, labelled Gravissima, which still survives as part of the 1925 Harrison organ. At the M'Ewan Hall, Edinburgh, next year, he derived his 32ft Quint (as he called it) from the Great organ contra tibia clausa, with reasonably good results.

Hope-Jones' 64ft stop was only an acoustic one; but in 1890 the Hill organ for Sydney contained a full-sized 64ft wooden Contra Trombone; a stop that was then, and surprisingly enough still is, unique -- for even in the world's largest organ at Atlantic City, America, the 64ft Pedal reed (the Dulzian) is only experimentally installed, and consists of the bottom CCCCC pipe only. (There is, however, a full-length 64ft diaphone in the same instrument.)

The Sydney organ, as was the general custom in those days with all important new organs, was erected and played in the factory before being shipped overseas, and one visitor described the 64ft reed as "a row of huge black boxes along the wall. The effect, when

> this stop was used with the 32ft and 16ft Pedal stops, was to add a remarkably fine drum bass, the vibrations of which could almost be counted."

This is not surprising when one considers that the 64ft CCCCC pipe gave rise to only 8 vibrations per second ! E.H.Lemare, the great recitalist, pronounced this stop an unqualified success, and said that after using it he had a curious and interesting aural illusion, all other stops seeming for a little while to sound an octave above their true pitch.

On page 328, the tonal make-up of the three largest Greats of the century were compared; it may be of interest to give here a similar tabular comparison of the Pedal organs of the same three instruments, together with the celebrated German-built Pedal by Schulze at Doncaster, which stop for stop was second only to Sydney.

	Total stops	Subfoundation.	Unison	Up to 15th	Mixtures	Reeds
St.George's Hall(1855)	17	2 @ 32	4	4	2: 9rks	5(1@32)
Doncaster (1862)	25	1 @ 32	5	8(4 tierce)	2: 4rks	8(1@32)
Albert Hall (1872)	21	3 @ 32	4	5	2: 8rks	7(1@32)
Sydney (1890)	26	3 @ 32	6	7	3: 9rks	7(1@64, 1@32)

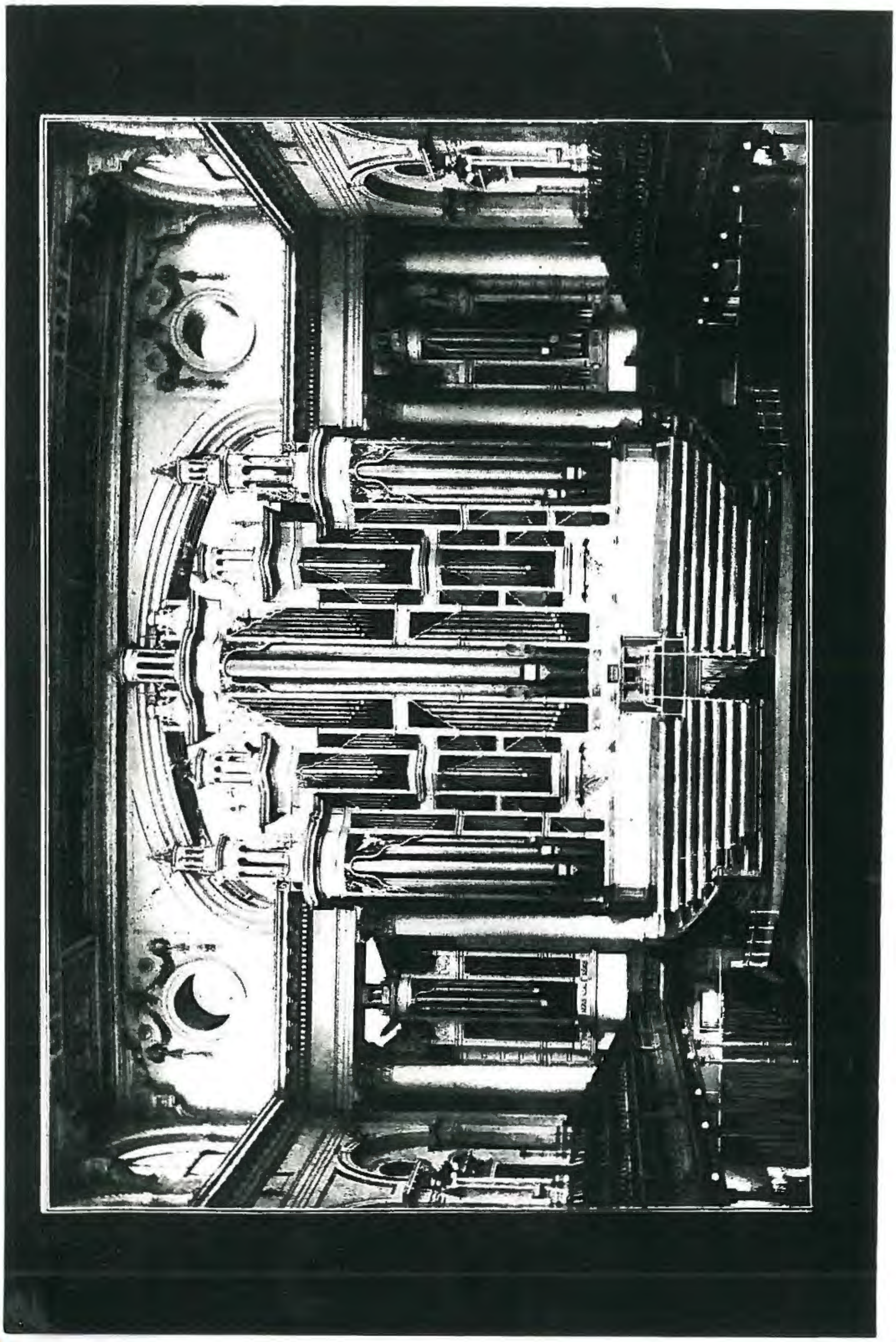

PLATE XVI.

Sydney Town Hall: general view of the organ.

Some slight idea of the size of the hall can be gained from the 32ft front pipes of the case, which was designed by Dr. A.G.Hill in the style of the seventeenth-century Northern Renaissance. Freeman describes it as Dr.Hill's magnum opus, and says that it is "certainly the finest 32ft front that ever emanated from England, where few of our architects seem to know how to deal with such large pipes". The hall has seating accommodation for six thousand people.

(Photograph from Org.24.83)

Up to the beginning of the eighteen-eighties, the Pedal had preserved a comparatively unaltered complexion for twenty or thirty years; time enough for any weaknesses in design to reveal themselves. Thus the way was prepared for the reformer Thomas Casson. Like the other great revolutionary of late Victorian times -- the engineer Hope-Jones -- Casson too was an "amateur" in organ-building: he was a banker by profession. His voice was first raised in two important books, "The Modern Organ" and "Reform in Organ-building" published in 1883 and 1888, and in many forcefully-expressed letters to musical journals; and in 1887 he founded the Positive Organ Company for propagating his suggested reforms, both tonal and mechanical.

Suffice it to say here that his ideas on tonal structure, as far as they affected the manual departments, have had some influence on twentieth-century design; his methods of control found little favour; but his preaching on the Pedal organ took effect rapidly enough. He is, in fact, nowadays recognised as the man who, more than any other single individual, laid the foundations of the modern Pedal organ. Even as early as the nineties, it was possible to discern a gradual change in Pedal-design along the lines mapped out by him.

He constantly inveighed against the Pedal's inadequacy and lack of variety, more especially when supporting the Swell; "It is

1) impossible" he very truly remarked, "to have basses outside that are not either too loud with the shutters closed or too

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1. Casson, "The Pedal Organ", pp 17-18.

"soft with them open. The position tolerated is as though we should have a string quartet, the executants of which should play with all refinements of expression and phrasing, but that to it should be appended a player instructed not only to bring a double bass of extra size and power, but to rasp it fortissimo throughout. No one would tolerate such lunacy in the orchestra; why is it tolerated in the organ ? It is generally recognised that the organ should not be treated as an imitation of the orchestra; but it has to be treated by orchestral analogy, and in this matter the analogy holds good."

Casson was not a merely destructive critic; there were probably a number of other people who had thought all this out for themselves. But he went further, evolving a three-point doctrine of the Pedal's function, and laying-down in theory and practice the means of following this doctrine with the minimum of additional expenditure of money or space.

1) "The office of the Pedal" he said, "is threefold.

"1. Primarily and essentially, to provide instantaneously an exactly appropriate bass for any combination of manual stops and couplers.

"2. To provide, upon occasion, an obbligato bass of character differing in power and tone from that of the manual.

"3. An extension of the second office, viz., provision of absolute solo effects on the Pedal for assertion of a melody, such as Canto-fermo or leitmotiv."

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1. Casson, op.cit., p.30

As the reader will at once realise on examining Casson's three points, the average Pedal of the period now under consideration had the tonal resources to fulfil the third, and, up to a point, the second (though the mechanical side of the picture for rapid operation of these resources was not as convenient as it might have been). But it was under the first heading that the obvious failure lay. A quiet combination of stops on the Swell or the Choir would find little help in most of the Pedal organs of the day. Bourdon and bass flute might sometimes be suitable in power -- but not always in tone -- with the box open, or closed, but not both, as Casson made clear; any alteration in the position of the shutters would completely upset the balance.

Like all propagandists, Casson was inclined -- pardonably enough, perhaps -- to overstate his case, as was pointed out on page
1) 191. In the quotation there given, dating from 1905, he declared that most English organs then contained only one or two Pedal stops, occasionally three, seldom four. The reader will realise by this time that the situation, even thirty years before Casson said this, was far from being as dismal as he would have his listeners belive.

His proposals on the constructive side, for improving the tonal resources of the Pedal, were again threefold. First was what he described as a type of "borrowing", but which we now regard as "extension", a more accurately descriptive term. This method, used

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1. Casson, op.cit., p.16

by Schulze at Doncaster and elsewhere, and strongly recommended by Hopkins, consisted in adding an extra octave of pipes to the top or bottom of an independent Pedal rank of, say, 16ft pitch, in order to produce additional stops of 8ft or 32ft pitch. Thus, on a 30-note pedalboard, a single "extended" rank of 54 pipes could do the work of three separate ranks totalling 90 pipes; such an arrangement is commonplace to-day. Even if one disapproves of manual extension, there are not the same objections to extension for the purely melodic requirements of the Pedal.

Casson's second proposal was to borrow the lowest one-and-a-half octaves of a manual stop and to use it for the upper portion of the pedal compass, completing the downward range with a 16ft octave of pipes in continuation of the borrowed ones. Thus twelve extra pipes provided a whole new Pedal stop which gave an exactly suitable bass for its parent rank -- for itself, in other words -- at 16ft pitch. This method was especially useful with enclosed stops, the additional octave being placed inside the Swell-box.

The third of Casson's suggestions, "though theoretically wrong" as he put it, was "nevertheless useful to some extent, and to that extent is admissible in practice. That is the borrowing of manual stops in identical pitch......usually the manual double of 16ft. It may be usefully done with light doubles for the following reason. The manual doubles are hardly ever used

1) Casson, op.cit., pp. 24-5.

"except in full combinations, when the pedal is reinforced by powerful stops. Thus the light-toned 16ft stops of the manual are not missed in the ensemble of the pedal, while they remain useful as the 16ft basses of the soft stops........"

Casson then proceeds to disarm his critics finally and effectively:

"One constantly comes across organs destitute of any quiet pedal stop, notwithstanding that the large and costly pipes that would form them are standing silent and inaccessible on the manual soundboards. In the face of such a preposterous state of affairs, the urging of doctrinaire pedantry against borrowing is simply ridiculous..........I do not claim that these methods are in a general way actually superior to independent pipes; but the organ problem is invariably how with a given amount of room and money the most perfect organ may be evolved........."

Casson's interests were not confined to tonal matters; on the contrary, this most constructive of reformers had a good deal to propose on the mechanical side, always in furtherance of his passionately-felt beliefs. This aspect of his work will be discussed later in the chapter.

As the opening paragraphs of this section suggested, his words did not fall on deaf ears; but before dealing with the immediate results of his influence, reference must be made to a very unusual reconstruction scheme carried out at Exeter Cathedral by Speechley in 1876. There were several curious features here; the first was that the old GG long-octave compass was retained on the Great, despite the alteration of Swell, Choir and Pedal to C compass. The second was the decidedly "old-world" appearance of its design, considering the date and the fact that its designer, Ouseley, was a man of the widest experience of organs both British and foreign, who had shown some twenty years earlier at Tenbury and was to show again in 1877 at the Sheldonian Theatre, Oxford, that his views on organ-tone were most remarkably advanced for their time.

But the third and most extraordinary feature was the Pedal in this Exeter organ: three stops, Double open diapason, Open diapason, Bourdon -- not a brilliantly over-abundant array to set against twenty-four manual registers. But on looking behind the stop-names we find that the double open and the 16ft open formed one extended rank of 35 pipes only, down to GGGG 21 1/3ft; the bottom seven notes of the 32ft stop were pipeless and silent, but the 16ft was complete. Moreover, the third stop, bourdon, had no pipes of its own but was borrowed from the double stopped diapason on the Great.

Here, then, were early and rare examples of Pedal extension and borrowing; but at the same time they illustrate rather unsatisfactory application of these procedures, for this Pedal had a basis of only one rank of pipes. Neither extension or borrowing should be responsible for the basic foundation (except on the very smallest instruments, perhaps); their purpose and value lies in supplementing an already adequate substructure of independent pipework. In this particular instance, the long compass of the Great would help in some measure to compensate for the weakness of the Pedal.

Ouseley's originality included the invention of at least one new stop, the Pyramidon: this was shaped like an inverted pyramid, the CCC 16ft note being produced from a stopped pipe only 2ft 9inches high; but the trouble was that it was also 2ft 3inches square at the top, thus occupying too much space on the soundboard. Probably for this reason, it never passed beyond the stage of experiment.

The first indications that Casson's proposals were beginning to bear fruit appeared in a few scattered instances in the late eighties and early nineties: and from about 1894 onwards borrowing and extension were quite widely used -- that is to say, their use was on a limited scale but was practised in a good proportion of instruments. Reference was made to the Tewkesbury Pedal on page 383; its 32ft harmonic bass was provided by the pipes of the 16ft great bass, partly by direct borrowing, partly by quinting; this might be called a "derived" stop.

This word "derivation" is one of several terms which are or have been in use to describe the processes which Casson propounded, and the techniques that developed from them. Other names are Borrowing, Duplexing, Duplication, Extension, Grooving, Transmission -- and, most picturesquely classical of all, "Metechotic" (how many organ-builders of to-day know the Greek word meaning "to share" ?) applied by Brindley and Foster to their own version of the process. Most of these terms have always been used loosely and without any real distinction of meaning; some of them, of course, have been introduced as euphemisms by builders too conscious of Polonius' advice to Laertes.

It is therefore high time that some sort of standardised terminology should be adopted, so that the meaning of any given word may be clearly accepted and understood. In modern usage, a slight clarification of terms is becoming noticeable; and in confirmation of this, it is suggested that the three words "borrowing", "extension" and "derivation" cover all the variations under the heading of this method of tonal augmentation accurately and precisely.

"Borrowing" describes the obtaining of a complete stop by one department from another at similar pitch: e.g. when a Pedal stop consists entirely of the lowest thirty pipes of a manual double, or when a Great stop is also playable on the Choir. "Extension" should be used when a rank of pipes is increased by extra pipes at either end of its compass in order to supply more than one stop in the same manual or pedal department.

It may happen that one of these extended stops is playable on another manual; in which case, the process is "borrowing" as applied to the second manual. Or again, as is very common on the Pedal, there may be a combination of the two: the lowest 18 or 20 notes of a manual stop may be borrowed and transformed into a Pedal stop by the addition of a lower octave of pipes. This Pedal stop can be referred to as "partly borrowed", which conveys the exact picture of what has happened, whereas the word "derived" or "duplexed" may not always do so. It is only in the rare instances where neither of these procedures has been applied that the less explicit word "derived" may be used, as indeed it was a few lines back concerning the Tewkesbury stop, harmonic bass 32ft. This was not a case of extension, as the great bass rank consisted of no more than its bare 30 pipes; and the harmonic bass was obtained from them only, but not by the means of straightforward borrowing.

At Canterbury Cathedral in 1886 and again at Truro Cathedral in 1887, Willis used an extended rank for his bourdon and flute, as well as for his 32ft and 16ft open diapasons; but these remained among the extremely rare exceptions to his normal preference for independent ranks for some years to come. In 1889, his organ in the
1) Hampstead Conservatoire had its Pedal violone borrowed from the double open diapason on the Great; this has become a common modern practice. However, as inter-departmental borrowing often seems to involve a complete change of nomenclature, it would be much clearer

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1. This organ was purchased in 1910 by Brighton Parish Church; a four-manual forty-two stop Father Willis organ only twenty-one years old -- for £400 !

to the organist -- particularly the visiting organist -- if some system of indicating the rank of origin were employed; this is done, for instance, at Atlantic City, where every rank is numbered and each of the 1,250 stop-keys is engraved with the number of its parent rank.

In 1894 at St.Peter's, Cranley Gardens we find Willis indulging in both borrowing and extension: the Pedal violone from the Great double, and the Pedal octave and bass flute from the Open diapason and bourdon; from then onwards, most builders realised the advantages of this practice, and made use of it more and more. The 32-16-8ft extended rank began to occur here and there; Lewis had a 16-8-4ft bourdon rank at Southwark. Reeds, at first, were extended only on rare occasions, Norwich Cathedral's 16-8ft rank providing almost the only rank before the end of the century. The 32ft reed was only "prepared for", but if it had been installed it would most probably have been done by extending the same rank downwards.

The growth of borrowing and extension, though due largely to the urgings of Thomas Casson, could not have spread so far and so fast without the improvements in action which were finding their way into most of the new and rebuilt organs. Borrowing was not impossible with tracker action -- had not Renatus Harris done it at Salisbury in 1710 ? -- but was cumbersome in the extreme. Pneumatic-lever was no better for this purpose: it was tubular action that made all the difference, with further possibilities opened up by electro-pneumatic.

Hope-Jones consequently was able to make a far greater use of these techniques than his contemporaries; but even he avoided using extension on the manuals. The general feeling had from the first been sternly opposed to extension here; and an illustration of this comes from the Rev. Dr. L. G. Hayne, that picturesque personality whose adventures in amateur organ-building and large-scale tonal design at Eton, Queen's College, Oxford and his Essex parishes deserve their own biography. He must have been one of the earliest men to have first-hand experience of extension.

1) "Extension was well-known to him," we are told, "he had it on his Pedal: open, with stopped bass and extended treble, making 32ft, 16ft and 8ft. He had played a 'Miniser Organ', which was all extension, so he knew of it on the manual........In a letter to my grandfather, he wrote as follows: 'The making of three stops out of one set of pipes is good practice. It saves space, but is not satisfactory on the manual: there are too many dumb notes, which pervert the music and make an organ monotonous and wearisome to both player and listener.'"

The exact identity of the organ referred to, with its 32ft stopped bass, is not clear. If it was Queen's (Walker 1866), then the stop had no right to be called double open diapason. But it is difficult to keep track of the organs with which Dr. Hayne had anything to do, as he was accustomed to supply and instal parts of them himself.

1. John W. Rayson (Ipswich organ-builder) in a letter to "Musical Opinion", March 1936, p.535.

regarding those parts as his own property -- with results that we
1) have already observed, when the time came for him to move on. Hayne died in 1883, so his opinions are interesting in that they date from the very earliest experiments in extension.

2) Other writers, such as Audsley, fulminate against its use on the manuals, but approve warmly of it on the Pedal. And that is, on the whole, the position of public opinion on the subject to-day, in spite of the undoubtedly fine work of John Compton in the field of whole-hearted extension. A limited amount of manual extension, such as a single 16-8-4ft chorus-reed rank, may occur fairly often, but all-extended instruments of more than moderate size are few, and are confined almost exclusively to the one firm.

For very small organs, however, there is much to be said for the increase in flexibility and tonal variety made possible by this process; a little organ of a dozen ranks, say, can be transformed into an incomparably more useful twenty-stop affair without any loss of its original character (if it had any) but with a great improvement in its general ensemble.

One other major tonal development of the last years of our century remains to be chronicled: the Hope-Jones diaphone. This, in its simplest and best form, was a "valvular reed", in which a circular valve, mounted on a stiff spring, acts as a resonator, taking the place of the reed-tongue. The diaphone, always placed on heavy

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1. vide supra, p.182
2. Audsley, op.cit., pp.17-18

wind-pressure, was capable of a tremendous volume of tone which had a certain value in adding weight and power to full Pedal, but which was hard to endure on its own. It was, in fact, originally designed as a foghorn, and the regret is often expressed that it was not kept in its proper place in coastal lighthouses and signal-stations. However, it has been refined and improved by Compton and appears regularly in the magnificent instruments which his firm has been producing since the end of the First World War.

Compton himself, writing in 1923, had some interesting comments to make on the diaphone in general and Hope-Jones' work in particular; and these words, from the man whose work to-day may be said to be descended, in many of its most advanced and individual aspects, from Casson and Hope-Jones, make a fitting close to this account of the Pedal organ in the nineteenth century:

1) "....The diaphone is not primarily or essentially a solo stop, and its musical value is not totally dependent upon the individual perfection of its notes. It may frankly be admitted that the best diaphone to be found in any Hope-Jones organ is more or less irregular and faulty in tone, and can seldom be used with really good effect except in combination with other stops.

"None the less, I consider the diaphone a most valuable and desirable voice, comparable in importance with the timpani of the orchestra. It usually has a harmonic development equal or superior

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1. John Compton, in Org.3.42-3.

"to a robust Violone or Schulze Contrabass (but with immensely greater power), and therefore its pitch is very much more definite and its stride more aggressive than that of the usual "pedal open", wood or metal. In rare instances, e.g. at St.Clement's, Ilford, the manual diaphonic horn can be used with excellent effect for horn passages in orchestral transcriptions; and some specimens blend very satisfactorily with the diapasons.

"But in the majority of his British organs, Hope-Jones did not continue the diaphonic construction above about middle C or F; from this point to the upper end of the manual compass he usually substituted high-mouth flue pipes of indefinite tone-quality — often windy and unsteady. The example at St.Michael's, Chester Square, has no treble at all. It plays at 16ft and 8ft pitch on the pedal, but on the Great (42 notes) in 16ft pitch only — a very singular arrangement ! In some early instruments the diaphones were playable only on the pedals; in 32ft and 16ft pitch at Worcester and Edinburgh, and in 16ft and 8ft, or 16ft only, in other places........."

The Action.

We have seen, during the third quarter of the century, the beginnings of electric action in the late sixties and of tubular-pneumatic in the early seventies, as far as their practical application in Britain was concerned. The main developments in the closing twenty-five years were such as to overcome many, but not all, of the worst weaknesses of these two new actions, and to bring them, if not to perfection, at least to a very satisfactory state of reliability, where organists were no longer afraid to make use of them.

Just as, in the early days of the pneumatic-lever, only a part of the organ was fitted with the new mechanism in a large number of cases -- usually the Great and its couplers -- so too was tubular-pneumatic at first introduced in this same cautious and piecemeal fashion. During the eighties, many instruments were equipped with mixed actions; tubular to Swell and Great in a number of instances, with lever or tracker for the other departments. However, as the following random examples will show, there was no standardised practice in this respect:

1883; St. Dominic's Priory, Haverstock Hill (Willis). Barker-lever to Great, Tracker to Swell and Choir, Tubular to Pedal.

1884; Lichfield Cathedral (Hill). Tubular to Great and Swell, Lever to the remainder.

1885; Beverley Minster (Hill). Lever to Great; tubular to Swell, Solo and Pedal; tracker to Choir.

1887; Coventry Cathedral (Willis). Barker-lever to Great and Swell; tracker to Choir; Solo, partly tracker and partly pneumatic; Pedal, "a now obsolete type of pneumatic" according to a 1934 description.

1888; Gloucester Cathedral (Willis). Great, Swell and Pedal tubular; Choir, tracker.

In other words, until the end of the eighties, no action had established itself as sufficiently superior to the others for it to be adopted with any freedom; all of them had some advantages which were balanced by corresponding defects. The lever was prompt (if the console was attached) but very noisy; the tube was quieter, but not always prompt; the tube, again, was less bulky than the lever mechanism and enabled the console to be more easily detached; but its efficiency varied inversely with the distance from pipework to keyboards. The defects of electricity were mentioned in Chapter Three, and will be referred to again.

In a few cases, tubular action was used in more or less the same way as the original prototype -- Booth's "puffs" at Attercliffe in 1827 -- for operating a distant group of detached pipes. Whiteley at Chester in 1876 had his main organ in the north transept, lever-operated; but four or five stops were placed on the choir screen, and were played by tubular-pneumatic action. Similarly, at St.David's Cathedral in 1883, Willis used tracker and lever for most of the organ; but there were two of the largest Pedal stops in the triforium, one on each side, connected to the console by tubular action. Examples of all-tubular instruments in the eighties are almost nil; even Willis, pioneer of this mechanism, tended to use mixed actions, as we have seen. Westminster Abbey (Hill, 1884) was one of the very rare all-tubular organs earlier than 1890.

Harrison, at St.Giles' Cathedral, Edinburgh (1887), produced an improved form of pneumatic-lever, which was described thus in the firm's specification:

1) "The pneumatic levers are fitted with an apparatus which works automatically, and supplies to them a graduated pressure of air, the pressure increasing and diminishing in proportion to the power of the organ in use. This is the invention of the builders, and while relieving the levers of much unnecessary work, it preserves silence in the touches when the soft organ only is in use."

The object and effect of this modification seems, in essence, to be
2) similar to Vincent Willis' "floating lever"; and it was no doubt for the same reason that it did not become more general -- namely, the advent very shortly afterwards of great improvements in tubular and electro-pneumatic actions.

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1. Org.19.165
2. vide supra, p.241

The turning-point, as far as pneumatic mechanism was concerned, was the invention of the Willis "supply" or "pressure" system of tubular-pneumatics, patented in 1889. Thus, in 1891, Wells Cathedral organ was converted to tubular throughout, and Exeter Cathedral organ was rebuilt with the new action to all departments; and henceforward Willis made the 1889 action his standard.

Other builders followed suit with their own improved versions of the mechanism (T.C.Lewis and J.J.Binns, for instance); and thus, during the last decade of the century, tubular-pneumatic action was finding its way into the majority of the important instruments that were then being built or rebuilt. Tracker action still had its occasional adherents in high places: Gray and Davison rebuilt the Liverpool Philharmonic Hall organ in 1899 with "new tracker action, with split pallets, and pneumatic action to the drawstops and composition pedals". St.Alban's Church, Teddington, after its 1895 rebuild by Lewis, was left with the most curious combination of actions: tracker to Great and Swell, pneumatic to Pedal, and electric to the third manual, the Solo.

In general, then, tubular was the standard mechanism of the nineties, with the majority of firms; but there were two builders who made it a more consistent practice to use electro-pneumatic — Hope-Jones in all his organs, and Lewis in a number of his better-known instruments. The two examples of remote Echo departments at Westminster and Norwich, already referred to, were quite exceptional for their builders, as indeed was Willis' solitary electric venture at Canterbury (which was probably the finest piece of electrical workmanship of all the pre-1900 examples). Willis' thoroughgoing engineering skill and consummate craftsmanship produced an action that worked splendidly through 120 feet of cable; and when it was finally dismantledfor reconstruction in 1939, after more than fifty years of the daily use that only a cathedral organ can experience, the electrical part of the mechanism was found to be in perfect order; only the pneumatic portions were worn out.

Some of the earliest electric actions were, alas, being removed during this period: St.Michael, Cornhill, for example, which Bryceson had built in 1868 as one of the first-fruits of his arrangement with Barker, was refitted with pneumatics by Hill in 1885. St. George's, Tufnell Park, another early Bryceson, suffered a similar modification at the hands of its own builder in 1884.

One of Lewis' early ventures in the electro-pneumatic sphere was at St.John's, Upper Norwood in 1882. Here again, there was frequent trouble from the outset, due to lack of adequate means of providing low-voltage current; but thirty years were allowed to pass before the retrogressive step was taken, not merely of substituting tubular for electro-pneumatic, but -- what was much more deplorable -- of replacing the old console, in its detached position where the organist could hear and judge what he was doing, by a new console in a close-up position where the unfortunate player was located to the worst advantage.

There are, unfortunately, no limits to the depths of ignorance and thoughtlessness displayed by organ-committees, aided and abetted by architects, over this question of the location of organs in general and consoles in particular. If the reader will for a moment excuse a digression into the middle of the twentieth century, the present writer has for some years been "presiding" at an instrument of 1937 vintage which has -- believe it or not -- a built-in detached console. Is this unique ? The organ was supplied from abroad, complete with detached stop-key console; this was directed by the church authorities,(whose chief adviser was the local bank manager !) to be placed in exactly the same position as the console of the previous tracker instrument. Skilled joiners were thereupon employed to construct the customary "cavern" under the front pipes of the Great; and there the console now sits, detached and yet built-in, with its yards of cable coiled within the organ-chamber as a reminder of what should have been. It is hardly necessary to add that the organist hears the organ much too well, the nearest six choirmen almost as strongly, and the congregation (cut off from sight and sound by the chancel arch) hardly at all. There are also, to complete the picture, two ideal and obvious alternative positions for siting a detached console. 1)

1. It is pleasant to be able to record a happy ending here. A generous benefactor enabled the console to be transferred recently to a detached position which is now ideal for the purpose.

Lewis' famous concert instrument at the People's Palace in 1888 was partially electric, on the Swell and Pedal only; and Alfred Hollins, the great blind organist and composer who was the Palace's first organist, wrote afterwards that the action was

1) "very successful except for the universal drawback at that time, -- viz., being compelled to use batteries only; there were no such luxuries as accumulators or motor-generators in those days. The last time I played there was in 1916, when accumulators were in use and the action was going splendidly"

Lewis' other and more celebrated masterpiece in Southwark Cathedral was entirely electric in its mechnnism -- electro-magnetic, to be precise -- and it survived in good working order for over half a century until its 1952 rebuild. Lewis' work in the field of electric mechnnism was undoubtedly progressive and sound, but any consideration of the subject during the period under discussion must inevitably revolve round the rather enigmatic figure of Robert Hope-Jones.

There is no doubt that much of the reputation that Hope-Jones built up during barely fifteen years' work in Britain was due to the many-sidedness of his undeniable genius; he displayed remarkably unconventional ideas on every detail of organ-building -- some of them mistaken, perhaps, but all of them adventurous -- and concerned himself not only with the action but also the console and its accessories.

1. Org.11.168

On the tonal side, his boldly unorthodox views on individual colours and on the complete chorus build-up, have laid him open to a great deal of criticism; but he was a first-class voicer, to whom the modern heavy reeds, orchestral string-stops, tibias and diaphones owe more than is sometimes acknowledged. His later association with the name of Wurlitzer and his unhappy end have tended to create prejudicial feeling which has nothing to do with his valuable and significant share in the history of the British organ.

He first came into prominence with his 1887 rebuild of the organ which he himself played at St.John's Church, Birkenhead, which was electrically controlled from a console that was not merely detached but actually movable. To show that there was "no deception" about this, Hope-Jones had a photograph taken and published, showing him, in academic cap, seated at his neat little three-manual outside the west door of the church with the flexible connecting cable snaking away into the gloom of the church's interior. Although his action still suffered from some of the handicaps of other electrical systems, it was a definite improvement on them all; and he showed how to make the maximum use of electrical connections, not only to link a detached console with the main body of the pipework, but also for the siting of scattered sections of pipework in different parts of a building.

Now that most choirs, at any rate in the Anglican Church, had moved to the east end of the building, there were new problems facing organists and organ-builders. One of the most glaring difficulties was that in many churches the organ was still at the west end and the choir now at the east: where, then, should the organist be ? And when this was answered, as so often happened, by the dubious solution of tucking the organ away in a hole in the chancel wall so that the organist could be within effective cuffing distance of his choirboys, the instrument lost most of its ability to accompany the congregation, especially if the nave was a large one.

Hope-Jones dealt with a question of this sort at St.Mary's Church, Warwick in 1897. He disposed his organ in four sections; one was on the north wall of the chancel, the second in the north-east corner of the nave, the third in the south-east corner, and the fourth at the west end; and the console was on the south side of the chancel. It must indeed have been very difficult for a congregation to drag in singing a hymn, literally surrounded as they thus were by organ-tone — front, rear and both flanks.

Such a scattering of pipework is, on the whole, exceptional; but it has often been found since then that the ideal method in a large parish church is to have the main organ at the west end, behind the congregation, and the Choir organ in the chancel, with the console in some third position, in the chancel but removed from the Choir pipework.

In the same year, 1897, Hope-Jones had again to use his electrical ingenuity in another feat of "organ-stowage", though on this occasion it was from necessity rather than choice. The new and magnificent M'Ewan Hall of Edinburgh University was built without any provision being made for an organ at all -- and it goes without saying that no self-respecting University is complete without an organ of decent dimensions in its principal assembly hall. So when the building was complete, the question arose of installing a large instrument without disturbing the architectural features or encroaching on the accommodation of the hall. Here is a description of the result:

1) "Only the Choir organ, the Solo tuba mirabilis and the Pedal dulciana can be said to be really in the hall itself. These stops are enclosed in a handsome oak case containing the pipes of the Pedal dulciana, and occupy the centre of the back wall of the platform. The Swell and most of the Solo organ are located in a room above the main staircase, with a swell front opening behind an elaborate case high up on the left as one faces the platform. Behind the corresponding case on the right -- practically on the landing of the staircase leading to the upper gallery -- will be found the 16ft diaphone, together with the Pedal bourdon and flute. The 32ft diaphone pipes are laid at an angle in an upper chamber nearly 100ft away from some sections of the organ, and speak through a semicircular opening near the roof, whilst the Pedal open wood is placed in a passage behind the platform and underneath the gallery

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1. Reginald Whitworth, in Org.13.223-4.

"upon which the Choir organ case stands. The Great organ is stowed away in several sections on each side of the Pedal open diapason in this same passage."

However much one may deplore the circumstances which made all this necessary, it cannot be denied that only with electric action was it possible to provide the hall with an organ at all. Moreover, the Edinburgh action lasted for over fifty years before a rebuild became unavoidable. By the time this came to pass, in 1952, we are told that

1.) "playing on it was an experience of some anxiety and even strong apprehension; ciphers were frequent and quite unpredictable, combination pistons emitted large blue sparks when touched and certain notes of the tuba mirabilis emitted a sort of muffled roar reminiscent of a caged and very angry bull......."

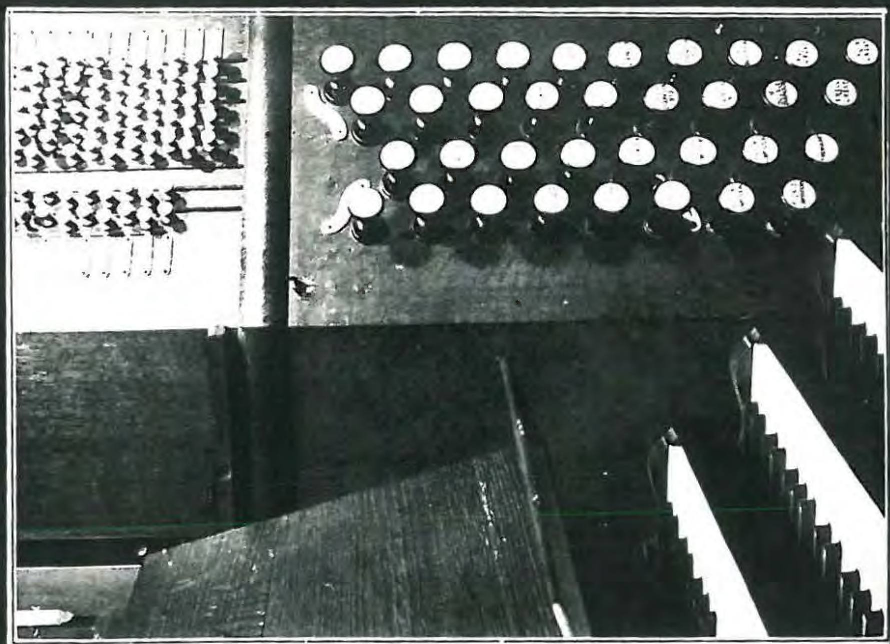
But all this was fifty-five years after its installation; whereas Hope-Jones' Worcester Cathedral organ was not so fortunate, as the action collapsed after about twenty-five years (though it must have been used a great deal more than the University instrument) and the Cathedral services had to be accompanied on a piano for about two years or more until a reconstruction became possible in 1925.

The precise extent of Hope-Jones' contribution to British organ-building is often debated; the final decision must be based on his work in the nineties, for very soon after the turn of the century

1. Org. 34 206

he migrated to America; and his work there is another story altogether. He left a number of permanent and by no means insignificant legacies to his craft; but in general it may be said that his greatest contribution lay in the stimulus he provided to the other, more established builders. He was a "cat among the pigeons"; in the suddenness and unexpectedness of his rise to fame, in his short-lived but lively career among his fellow-craftsmen, in his utter divergence of outlook from any of his precedessors or contemporaries -- in all these ways, he was a disturbing, provocative element in the rather placid, rather complacent world of British organs. His whole approach to his work was so redolent of the amateur, the experimentor, the inventor -- all three tinged with more than a touch of genius -- and formed a total contrast to the apprentice-trained "fifty-years-man-and-boy" traditional journeyman's attitude of so many of his rivals. He infused a new feeling into the world of organ-building, at a time when the prevailing mood seemed almost one of stagnation: a feeling of novelty, of vivacity, of new paths opening up fresh possibilities. He was, in short, a revolutionary: in the eyes of some of his contemporaries, he must have come very close to being an anarchist.

He certainly aroused strong opposition -- this, indeed, may be taken as a measure of the potency of his challenge to orthodoxy -- and there are many stories of his organs being tampered with, both in England and later in America. False rumours were circulated of fires



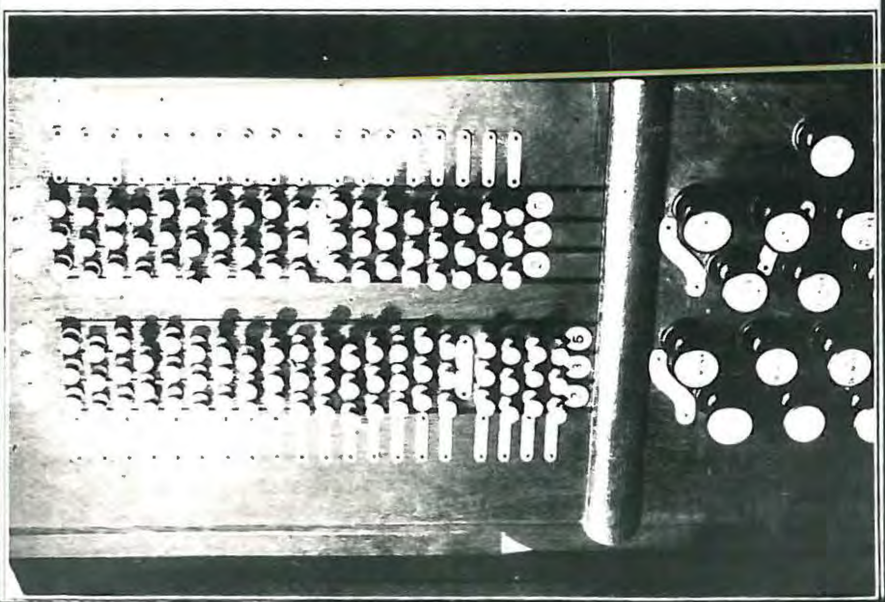


PLATE XVII.

Adjustable-piston mechanism
at Hereford Cathedral.

Close-up views of Willis' unique piston-adjusting apparatus on his 1892 console at Hereford, which remained in good working-order for over forty years. There are as many as three hundred ivory knobs, providing an effective means of pre-setting the piston combinations; but the experiment was so costly that Willis never repeated it.

(Photograph from Org.12.135, by H.Stubington) caused by his electric action; in fact, if any church containing an organ of his was unfortunate enough to have a fire, the electric action had to bear the blame,

1) "regardless of the fact that the trifling current in use would occasion no such catastrophe, and even to-day some organists and committees who would not hesitate to have an organ blown by electricity of considerable voltage, are afraid to have an organ working on 6 to 8 volts, for fear of fire."

The Pedalboard.

The compass of the pedalboard had reached, in most organs, the reasonable minimum of 30 notes, up to F, with occasional appearances of the 32-note G compass. What still remained far from settled was the shape of the board and its exact position relative to the manual claviers. Boards were flat and straight, they were concave and straight, they were concave and radiating; there may even have been some that were flat and radiating, as at York Minster of yore. The vertical distance from manuals to pedals varied considerably; and there was also an appreciable amount of divergence in the horizontal placing of the board, i.e. in the distance which the pedal sharp keys lay back relative to the edge of the manual keys. But perhaps the biggest apple of discord was the lateral location of the board; that is to say, the question of which particular pedal note was to be under

1. Whitworth, in Org.6.19

which particular manual note.

It was with the laudable object of introducing some agreed and regular standardisation into these and other sources of confusion that the College of Organists (not yet Royal) in 1881 inaugurated a Conference of organists and organ-builders to make decisions "with regard to great uniformity in the external arrangements of organs." This Conference produced some excellent results, as far as some of the recommended console-arrangements were concerned, for the College, although only seventeen years old, was becoming very influential. But by the same token, those resolutions on the pedalboard which we see now (and which many saw in 1881) to be mistaken, had the effect of prolonging the life and importance of a pedalboard of inferior shape and location.

Here are the relevant resolutions in full:-

1) 1. That the compass of the pedals be from CCC to F, 30 notes.

2. That the pedals be parallel.

3. That the pedals be concave, with radial top facings, and that the concavity be the arc of a circle having a radius of 8 feet 6 inches,

4. That the length of the centre natural key of the pedals be not less than 27 inches.

5. That the fronts of the pedal short keys form an arc of a circle having a radius of 8 feet 6 inches, and that the length of the

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1. Audsley, op.cit., II.p.132 (Nos.1-6) and p.125 (Nos.7-11)

centre short key of the pedals be not less than 5½ inches.

6. That the pedal scale be 2⅜ inches from centre to centre of two adjacent natural keys.

7. That a plumb-line dropped from the Middle C of the manuals fall on the centre CC of the pedal board.

8. That a plumb line dropped from the front of the Great organ sharp keys fall two inches nearer the player than the front of the centre short key of the pedal board.

9. That the height of the upper surface of the Great organ natural key, immediately over the centre of the pedal board, be 32 inches above the upper surface of the centre natural key of the pedal board.

10. That the relationship between manuals and pedals be subservient to the fixed relative position of the Great manual keyboard and the pedalboard already defined; it being understood that the position of the Great manual will determine the position of the other manuals.

11. That it is undesirable to alter the relative positions of the several manual keyboards as commonly found in English organs, viz: Swell above Great, Choir below Great, Solo above Swell.

(Other resolutions go on to refer to parts of the organ not concerned with the pedalboard.)

The two most controversial resolutions were the second and the seventh. This latter, placing the pedalboard in what was known as the "C under C" position, aroused immediate opposition because the higher pedal notes were thus uncomfortably far to the right -- the board was, in fact, not centrally placed, but was distinctly to the right of centre. The preference for parallel pedals over radiating was another retrograde decision, for most builders continued to manufacture their boards to the pattern thus blessed by the College; Willis was almost alone in adhering to his own concave-radiating board, which had been a regular feature of his consoles since 1854. Not until the later nineties did other builders venture out of the shadow cast by the second College resolution.

In the closing years of the century, an interesting discussion was initiated by Dr.C.W.Pearce in the pages of a leading musical journal.1) An accurate, first-hand picture of the state of affairs at the end of our period, and of the attitude of organists towards the "lower limb" of their instruments, is provided by the following extracts, dating from the years 1898 and 1899.

In his opening article, after referring briefly to the College resolutions, Dr.Pearce writes: "These resolutions and recommendations were wholly or partially adopted by certain organists and builders at the time they were first published; and since then the growing popularity and influence of the College have gained for them a still wider recognition. But the fact remains that they did not meet with universal acceptance in 1881, nor do they

1. "The Organist and Choirmaster", 1898 and 1899.

receive it now, and it is at the best an open question whether they will ever be adopted.......

"No organist who has the privilege of frequent intercourse with his professional brethren can have failed to observe in all directions a growing discontent with the playing arrangements of Organs as they were determined by the College twenty years ago. A letter received by me only a few days ago contains the following sentence underlined: "The present pedal board is clumsy, awkward and difficult to use, and is an insult to a good player'.......

"The last College conference has already done immense good in one respect at least; whereas in 1881 there were many kinds of pedal boards to be considered, most of these -- including all the objectionable flat varieties -- are now happily disposed of, and we are chiefly (if not exclusively) concerned with two only, viz., those respectively known as the 'College' and the 'Willis' boards. The College pedal board is (1) parallel and concave, and (2) with the fronts of the short keys forming the arc of a circle, it is so arranged that the centre CC of the pedals is directly under middle C of the manuals............The Willis pedal board (invented by the late Dr.S.S.Wesley, and used by the eminent builder Mr.Henry Willis in every organ erected by him during the last forty years or more) is radiating and concave, and is considered by many of our most distinguished British organists to be by far the better and more convenient of the two, because the upper extreme of the pedal clavier being brought nearer to the player, the high notes are much easier to reach than they are upon the College board. This most desirable convenience is not arrived at solely as the result of radiation, but from the fact that C is not placed under C, but further to the left..........

"To Mr. (now Dr.) F.J.Sawyer of Brighton belongs the honour of opening the ball by stating that a radiating board is easier to play upon, because the foot, when moved either way with the heel as a pivot, describes a fanlike figure." (Dr.Pearce is here quoting from the report of the proceedings of the 1881 conference.() "This was at once objected to by a speaker, who remarked that by giving the leg a pendulous motion the foot indeed rises at the beginning and end of each swing, but that the toe does not turn out in the direction indicated by a radiating board, the circle described on the pedals being solely vertical, and in no sense a horizontal one.

"It was further urged that with radiating pedals, the distances between notes forming the same intervals were not identically the same throughout the entire range of the board, and that the use of the heel in pedalling was found to be awkward from the smallness of some of the spaces between the notes. There happening to be present a majority of members in favour of straight pedals, the verdict was given in favour of the straight but concave board."

"The next question which occupied the Conference was the vertical position of middle CC of the pedal board with respect to middle C of the manuals. A majority of members were in favour of this, for the most superficial of reasons, viz.,(1) that C under C was not merely an idea, but a 'theoretical point fixed in the musician's mind', a 'principle which would hardly be expressed, but which was recognised, and was a feeling which could not be disposed of'; and (2) that as the pedals were principally used from say G to top line A,.....therefore the convenience of reaching the high notes need not be taken into consideration ! The attention of the meeting was further drawn to the fact that the bottom notes of the pedal were then (20 years ago) sometimes heavier of touch than the upper range, and that therefore the player required to be nearer to them. The 'pendulous motion' of the leg appears to have met with a good deal of derision from eminent organists outside the Conference, but their remarks in the musical press of the day carried no weight at the discussions.........

"What possible connection could there be" continues Dr. Pearce, "between a theoretical 'point' or 'idea', an 'inexpressible something' and a real tangible practical question, I entirely fail to see, and the subsequent proceedings of the Conference appear to shed no light on this extraordinary matter. Yet mainly for this reason, and because it was asserted that the upper pedal keys were of no actual use (why were they ever put there ?) the convenient and common-sense Willis board was rejected. Nowadays we find that we must use these selfsame upper pedal keys, if we are to perform present-day organ compositions; and of course tubular-pneumatic and other actions have entirely removed the objection that the lower keys require a heavier pressure of the foot than the upper ones. It therefore seems necessary that newer and more up-to-date reasons must be given for the retention of the present College pedal board. What are these reasons ? And if it really is easier to play upon a College than upon a Willis pedal board, why is it easier ? It may be that the ideal pedal board has yet to be invented.........."

One of the first to comment on Dr.Pearce's remarks was Charles F.South, the organist of Salisbury Cathedral, who, after denouncing the "C under C" pedalboard position, wrote ".........I can speak from about twenty-six years' experience that a Willis board is the pedal board to play on; you don't want to find the notes, they seem to find you ! Henry Willis has done much, very much for organists, and he can still play in a way that many players would envy."

Another correspondent, writing under a nom-de-plume, said:

"......Let anyone sit on an organ stool and stretch his feet out to bottom C and top F, and see the positions taken by toe and heel of each foot; undoubtedly it is radiating. It is in fact difficult and even painful for a man with short legs to place his <u>heels</u> on both these notes simultaneously on a College board, but quite easy on a Willis.........Willis does not put C under C, but D under D, which is quite another thing, especially now the pedals are going up to G, 32 notes. If this is to be the compass of the future.....then radiation will be absolutely a necessity.....

"Willis also raises the sharp keys so that they slope upwards towards the instrument, consequently the foot feels the whole note comfortably and not just the point; this gives a feeling of great security and pleasure in playing.........."

Dr. Pearce summed up the state of feeling as being mostly in favour of the concave radiating board, for the following reasons:

1. The player sits over the centre of the pedals (which is an impossibility where C is under C.
2. The Willis board is easier to play upon because it meets the actual natural radiation of the feet.
3. It is therefore more convenient for playing difficult passages.
4. It does away with the necessity of movable seats, or of holding on for dear life to the sides of the organ stool during the performance of, say, the pedal solo in Bach's Toccata in C.
5. It is quite easy to play the high and low notes with the right and left heels respectively.
6. As the pedal board is slowly but surely extending its upward compass,

and modern organ music demands the employment of these high notes, it seems highly probable that, at no very distant date, the R.C.O. board will have to be modified in some way or other. The Willis board, on the other hand, satisfies these new conditions, being entirely 'up-to-date'.

"These reasons must appear to any impartial reader to carry weight; at any rate, they are really reasons, and neither excuses nor apologies. Now, what can be said in favour of the R.C.O. board ?

1. It <u>is</u> the R.C.O. board, the one sanctioned by the most eminent body of organists in the world, and popularised by nearly twenty years' use.
2. It <u>must</u> be played upon by every person who desires to become A.R.C.O. or F.R.C.O.
3. It is said to be used far more extensively than the Willis board, and that therefore the minority of organists who prefer radiation should give way to the majority, who are not accustomed to it.
4. It is not easy to see what is wanting in the R.C.O. board.
5. The 'C under C' system satisfies a 'theoretical idea' which is said 'to exist in every musician's mind' -- an inexpressible something, but still -- a something".

Dr.Pearce has succeeded, perhaps better than he intended, in bringing out the utter fatuity of the reasons for retaining the College board.

The only reason carrying any weight at all was the second, regarding Diploma candidates, which of course had nothing to do with the merits of the board itself. However, the final outcome, as all organist-readers are aware, was that the College board died a natural death soon after the beginning of the new century, and the radiating-concave board is now universal, though not always of the exact Wesley-Willis dimensions.

Console details.

By the year 1900, a detached console was no longer a nine-days' wonder; developments in electric and pneumatic actions had been gradually bringing about this state of affairs during the last three decades of the nineteenth century. Hope-Jones had shown that a console could be not only detached but also movable; and although this second attribute might not be so necessary in a church, it is certainly of value in a concert hall, where the platform may be required for many purposes -- and not all of them musical. It is all to the good if the console can be tucked away out of sight when it is not needed, and then moved into its proper place in the orchestra near the conductor for concert purposes.

Yet how often is it still the case, even in the most recent of concert organs, that the console remains a fixed one, occupying its old traditional place at the back of the chorus. Consequently, the

organist is further from the conductor than any other performer, seeing him only in a mirror, unable to hear the organ properly except in the loudest combinations of stops, but hearing much too much of the chorus tenors and basses. W.T.Best's first comment, when asked for his opinion on the new Queen's Hall organ after he had opened it
1) in 1893, was "Well, it's out of the way." Much the same remark might be applied to very many organs that should have benefitted from forty, fifty and sixty years' development of organ-building techniques and experience since then, but whose designers have preferred them to remain "out of the way".

Apart from the actual location of the console, builders were experimenting with the various details of stop-control and other matters of importance to the player's comfort — and therefore efficiency. Willis, followed by Hill, had taken the lead in providing oblique stop-jambs, in which the drawstops were disposed at an angle of 40 or 45 degrees instead of being flat against the casework of the organ. It must be realised that, with tracker action, any angled position of the stop-jambs caused complications to the internal mechanism of the stops; so it follows that the spread of improved actions removed these difficulties and enabled the flat stop-jamb to fade away gradually as the century drew to a close.

The receding or backward-sloping stop-jamb, which had been tried in a handful of organs soon after the mid-century, did not find

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1. J.Newburn Levien, "Impressions of W.T.Best", p.44

any supporters; and so the upright, angled jambs with the knobs arranged in vertical columns became the standard pattern. Variants were few; Lewis, at Southwark and elsewhere, set his stops out in horizontal rows, level with the manuals, and he sometimes (though not at Southwark) placed his couplers as a separate row of drawknobs above the top manual. A contemporary photograph of the Edinburgh University Music-Room organ (Hill, 1861) shows the stops arranged in horizontal terraces, after the French fashion.

Meanwhile, alternatives to the drawstop were appearing. There was nothing startlingly new in the stop-key idea, as previous chapters have shown; but the almost sensational novelty attached to everything that Hope-Jones did, resulted in the use of stop-keys (which were an integral part of his mechanism) being given a fresh and, as it transpired, lasting impetus. Moreover, he did indeed improve on any prior stop-key system, and the two types of stop-key used by him were both comfortable and reliable.

In most organs he used the "rocking-tablet" type, familiar to modern players in the form adopted by Willis for the couplers of many of his recent instruments; it hangs vertically, pivoted through the centre, and a slight push at the lower end puts it "on". Hope-Jones used also, at St. Michael's, Chester Square and at Ambleside for example, the "lever" pattern of stop-key, such as is in general use to-day with a number of firms. Here the stop-key is pivoted at its rear end and protrudes almost at right angles from the console, requiring a slight up and down movement to be put "on" and "off".

The relative merits of stop-key and drawknob are outside the scope of this work; but a survey of the principal new consoles of the present time would seem to indicate that stop-keys, though widely used, have by no means gained the ascendancy over drawstops. Most organists of experience have had ample opportunity to make trial of both kinds of control; and it is significant that, in the great majority of cases, drawstops are still fitted -- either wholly or for the speaking stops at least -- whereas a choice of one or the other is usually offered by the organ-builder.

The colouring of stop-knobs was tried again on at least one important organ: Leeds Parish Church (Abbott and Smith, 1899), where, on the left-hand jamb, the Swell stops were white, Solo green, Choir blue and couplers red; and on the right-hand jamb, Echo blue, Great white and Pedal red. This, however, remained quite exceptional, and the only concession normally made to colour-conscious organ-designers was the use of red engraving on the plain ivory drawstops to denote couplers; Willis was one of the leaders in this trend, as he was, too, in the parallel tendency to group couplers together with the stops of the department they affected, a move which owed much to Thomas Casson's instigation and which, in common with the red-engraved lettering, is now standardised.

Hope-Jones used colours on his stop-keys -- red for couplers, black for reeds and white for flues -- at St.John's, Birkenhead (1887 and 1894), though subsequently he preferred to use a small coloured stud placed above each stop as an indicator; at St.George's, Hanover Square and at St.Clement's, Ilford, for example. Coloured stop-keys became a well-known feature of the cinema-organ console, usually with red for the reeds and amber for the celestes; but church and concert organs of the stop-key type have always preferred to adhere to plain ivory.

The Plymouth firm of Hele began to produce their own especial version of stop-key, which appeared first at Marylebone Presbyterian Church in 1896. These were ivory tablets placed in rows between the manuals, immediately above the manual to which they belonged; a downward tilt to the right brought the stop "on".

The Swell-pedal was another part of the console that received the College of Organists' attention in 1881. One of their resolutions laid down

> "that there should be some contrivance to fix the swell-pedal at any point of its descent at the will of the performer."

This, it must be appreciated, does not specify the balanced pedal as such; in fact, the word "descent" implies the vertical movement of the lever-pedal, and there is no indication that the balanced pedal entered the minds of the members of the Conference.

Whether or not it was in consequence of this resolution, most builders continued to use lever-pedals in one form or another. Even Hope-Jones used them in several of his organs; and Willis produced a version which exactly answered the College's requirements, and installed it at St. Bees in 1899. The two lever-pedals on this instrument, for Swell and Solo, could be "checked pneumatically in any position in which they may be left". This was an improvement on the customary "trigger-pedal" (such as Willis was still using even at Lincoln Cathedral in 1898) which could be checked, not "at any point" but at about two or three fixed points at the will of the carpenter who cut the notches in the trigger. Another large end-of-the-century Cathedral organ to be fitted with these anachronisms -- for so they should have been regarded by that date and in an organ of such importance -- was Norwich, by Norman and Beard in 1899.

The most active firm in supporting the balanced pedal seems to have been Messrs Hill, who used it regularly in the nineties. Birmingham Town Hall was rebuilt in 1890 with balanced pedal to Swell and lever pedal to Solo; but, according to a correspondent in the "Musical Times" at the period of the College of Organists' conference, Birmingham had a balanced Swell-pedal even before 1881.

Sydney Town Hall, strangely enough, had lever-swells only; but splendid examples were set by Hill to other builders with his balanced pedals in such places as King's College, Cambridge (1889, three), Queen's Hall (1894, two), Peterborough Cathedral (1894, three), and Middlesbrough Town Hall (1898, three). The novelty of these pedals in 1894 is illustrated by Elliston's description of those on the new Queen's Hall organ:

1) "There are two balanced swell pedals (unlike those in general use) placed over the centre of the pedal board, and side by side..... In appearance they somewhat resemble the blow pedals of a harmonium."

Hill did not always place them centrally; at Peterborough the Swell pedal was central but the Solo and Choir pedals on the right side, while at Middlesbrough the three pedals were grouped together but were placed much further to the right than we are accustomed to to-day. A quaint idea was introduced at St.Catharine's College, Cambridge (Norman and Beard, 1894) where the two balanced Swell and Choir pedals were central, but there was in addition a further balanced pedal for the Swell on the extreme right. Was this a concession to organists who could not rid themselves of their lever-pedal-habits of hanging the right foot permanently on the swell-pedal and using only the left foot for playing on the pedal keys ?

Several of the less exalted builders deserve honourable mention for producing early examples of the balanced pedal. Among these were Abbott and Smith (Dunfermline Abbey, 1882), Brindley and Foster (East Retford Parish Church, 1886) and Conacher (Castle House, Calne, 1896). Both Walker and Lewis were using balanced pedals before the end of the century: well-known instances, both in 1897, were St. Margaret's, Westminster and Southwark Cathedral respectively, though the latter had a trigger pedal to the Solo box.

1. Elliston, op.cit., p.106.

Lewis also devised a balanced Crescendo pedal -- examples of which were found at St.George's West Church, Edinburgh and at Southwark -- which gradually brought on the full organ without moving the drawknobs. Dr.Hollins described this as a most useful device and his opinion must be respected, though the disadvantages of a crescendo pedal which leaves the stops unchanged would not have been so apparent, naturally, to a blind man. The crescendo pedal, as we know, was not entirely a novelty;[1] but it was, and remained for some time to come, a rarity whose value and efficiency were neither of them so self-evident as to create a pressing demand for its universal introduction.

A permanent part of the mechanism on all new Willis organs of this period was his pneumatic combination apparatus, with its brass pistons projecting from the key-slip below the manual whose stops they affected. They were not always fitted to each manual, however; as, for instance, at Christ Church Cathedral, Oxford in 1884 and at Truro Cathedral in 1887, where there were four pistons each for Great and Swell only. Coventry Cathedral in 1887 had two to the Choir as well as six each to Great and Swell; and altogether Willis did not seem to have any consistent policy on the allocation of pistons until almost the end of the century -- not unnaturally, with a contrivance that was still new and uncommon, a period of practical trial had to elapse so that performers and builders could find out the best means of making effective use of it.

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1. vide supra, p.279, for earlier versions of crescendo pedal by Hill, Willis and Lewis himself.

We find him supplying an equal number of pistons to all four manuals at Salisbury in 1876 and Canterbury in 1886, four pistons in every case; but there were also a number of his organs with some manuals pistonless during the same period, as the last paragraph showed. Again, in the nineties, he provided all manuals with pistons at Hereford (1892), St.George's Hall, Liverpool (1897), Lincoln (1898) and St.Bees (1899). But at St.Peter's, Cranley Gardens, the Choir is not provided for, and at Cirencester Parish Church (1896) there are no combination pistons at all, merely two reversible pistons for couplers. Hereford and Lincoln show an approach to modern procedure in the allocation of more pistons to Great and Swell than to the smaller departments: Great, Swell, Choir and Solo had 6,4,3,3 and 7,7,5,5 respectively.

1) What is of the greatest importance is the reappearance of adjustable pistons in the nineties in two different forms, the one unique and impracticably expensive, the other simpler and perfectly efficient. The Hereford adjustable apparatus (1892) consisted of nearly three hundred small ivory studs placed above the drawstops on

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1. The word "reappearance" is used in deference to the rather doubtful possibility of the St.George's Hall pistons having been adjustable in 1855 (already mentioned on p.268). Mr.A.Thompson-Allen, writing as a director of the Willis firm, says in a letter to the "Musical Times" of September 1938 (he is commenting on a previous article in praise of the recent Harrison rebuild of Father Willis' Winchester organ): "Also, we are told that the new adjustable piston action has an advantage in that the combinations may be altered whilst the wind is off ! This applied to St.George's Hall in 1855 and in numerous organs by all builders from that time onwards....." (He then goes on to discuss the Hereford mechanism).

each jamb, by means of which the desired combinations could be set or altered on every piston in a moment. The mechanism worked perfectly well for over forty years until the organ was reconstructed; but it was never used elsewhere. Willis remarked afterwards "I only did
1) this to please Sinclair, but the complication was terrible and nearly drove me silly. I will never do it again."

A more workable system was the one used at Lincoln Cathedral, St.Paul's Cathedral, and St.Bees Priory during the years 1898 and 1899. This comprised a switchboard at the rear of the console on which the stops of each department were represented by three-way switches — on, off and neutral. These mechanisms, like all Willis' work, continued to function satisfactorily for thirty and forty years and longer.

At least three other British builders produced adjustable combination actions during the nineties. Walker at St.Matthew's, Northampton had tubular-pneumatic key-action, but for his drawstops and pistons he used electro-pneumatic, whereby every piston and composition pedal could be adjusted either at a panel or at the console. Abbott and Smith in 1898 built a three-manual organ in Ryde Town Hall, Isle of Wight, with three adjustable pistons to each manual.

Hope-Jones, as was to be expected, made use of adjustable combinations, and his version approached very closely to the "capture" system in general uses to-day, as distinct from the switchboard arrangement of Willis and Walker at that time. At M'Ewan Hall, Edinburgh,

1. Dr.G.R.Sinclair, organist of Hereford Cathedral from 1889 to 1918; "G.R.S." in Elgar's Enigma Variations.

one of the composition keys on each manual was adjustable,

1) "....controlled by broad ivory combination keys, placed at the treble end over the particular keyboard whose stops they affect. That for the Pedal, however, is situated over the bass end of the Great organ keyboard. Rising through the centre of the back portion of these broad ivory combination keys will be found short ebony keys, like small sharps. These are the 'setters', which, when touched, set the existing departmental combinations on the adjustable combination key concerned."

At this stage in organ-building history, it is interesting to notice the United States beginning to play more than a passive, observer's role; she now began to show the first signs of that especial mechanical ingenuity which has become her principal contribution to the art of the organ. Apart from the uncertain priority of Willis' pistons at St.George's Hall, the credit for first inventing a system of adjustable combinations — operable at the console — must go to

2) the New York builder, Hilborne L. Roosevelt in the year 1882.

Besides the usual circular type of thumb piston (and the Hope-Jones composition key), two other patterns of combination-control made their appearance. Lewis used what he called "key touches" between the manuals of his organs at Southwark and at St.George's West Church, Edinburgh, operating on stops and couplers like the orthodox pistons; each row of "touches" was placed above the manual it affec-

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1. Org.13.228
2. Audsley, op.cit., II, p.408.

ted, being intended to be operated by the fingers, not the thumbs. Alfred Hollins, describing the origin of these "key-touches", relates how Lewis

1) "....came to our house and took out of his pocket ten small pieces of ivory of key-touch shape and placed them between the black keys of the piano in different groups, as he thought they should be placed on an organ. I suggested a slight alteration. He suggested another. So we went on for over an hour......."

The figure ten rather indicates that this was at the time Lewis was rebuilding at Southwark, for it was the number allocated to each of the four manuals on that instrument. When Lewis fitted these key-touches to his new Edinburgh organ at the time of Hollins' appointment there, the great blind organist was asked by a member of the congregation (probably the immortal "dear old lady" of this kind of story) whether
2) "those little things" between the black keys had been put there to help him find the right notes.

The Hope-Jones "compound composition keys" were rather more complicated either than Lewis' key-touches or than his own "composition keys" which we have examined at Edinburgh's M'Ewan Hall. These were in three parts; t e right-hand black section of the key gave the manual combination of stops when pressed; the left-hand black section gave a suitable pedal with manual-to-pedal coupler; and there was also

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1. Hollins, "A blind musician looks back", p.185-6
2. ibid., p.239

a central ivory key which pressed down the two black sections simultaneously. Yet another of Hope-Jones' devices was the "suitable bass stud", which seems to have resembled Casson's "pedal help", except that the latter was continuous in its operation, enabling the pedal stops to, as it were, "follow" every change of manual stops.

In 1891 at Exeter Cathedral, Willis experimented with reversible knee-pistons for certain accessory stops; and Lewis supplied "knee-touches" to a residence organ built at Frodsham in 1890. However, neither of these innovations were followed up.

One of the most ingenious of Hope-Jones' many inventions was "Double touch", but for reasons that certainly do not originate from the organist's viewpoint it is not yet in such wide use as it deserves to be. Consequently many players have little or no experience of it, which in turn perpetuates the vicious circle that prevents the device from being specified in new organs more often. Those who have had the opportunity of using double-touch have found it a useful accessory. The cinema adopted it, and it was most effectively used by the few real organists among hundreds of jazz-pianists attempting to play an instrument they never learned to understand.

Hope-Jones used it for certain solo stops and for the more important couplers. For example, at Worcester Cathedral and at Edinburgh, the couplers Solo-to-Great, Swell-to-Great, Solo-to-Swell, Choir-to-Swell and Swell-to-Choir were all double-touch couplers, enabling sforzando or solo-melody effects to be produced momentarily without change of manual or of registration. Moreover, some of these couplers have double-touch stop-keys; the first movement brings on the desired coupler to operate on second-touch (i.e. by increased pressure of the manual key) and the second or complete movement of the stop-key brings on the coupler to normal touch.

Hope-Jones' second (1894) rebuild of his organ at St. John's Church, Birkenhead had the Great organ tuba and its Pedal extension on double-touch, as well as couplers, but in general he did not use this device for speaking-stops so much as for couplers, until after his arrival in America.

Thoughts of cinema-organs provoke thoughts of percussions, which continued to appear here and there towards the end of the century, and not only in secular instruments. Besides the gongs at Westminster and Norwich, there were chimes on the Solo of Hill's Middlesbrough Town Hall organ in 1898. But perhaps the most sensational and prophetic use of percussions was to be found at St. Michael's Church, Folkestone, where there was a most energetic and enthusiastic Vicar from 1873 until 1908, the Rev. E. Husband.

1) "He purchased the organ that Henry Jones built for the 1886 Folkestone Exhibition, and on it, during the season, he gave weekly organ recitals. These always included his famous 'Storm', a realistic piece of work, for the presentation of which he had added

1. Org.16.162.

"the traps of the modern cinema organ. There were drums, bells, cymbals, a rain and wind machine (i.e. a rotating barrel of dried peas worked by a choirboy) and a stop to imitate the bagpipes (i.e. as pungent a viol as could be voiced at the time)........It is recorded that, during Mr.Husband's absence one Sunday from his duties as priest-organist, the officiating deputy, who was a stranger, threw himself back in his seat during the sermon and started a terrific roll on the drums. (They were set in action by a large flat piston fixed to the back of the seat.) Not knowing this, he had to be forcibly dragged from the organ before the service could proceed."

The Wind-supply.

To complete the story of nineteenth-century mechanical blowing, it remains to record that hydraulic engines maintained their position as the most widespread means of "raising the wind", but that a fair number of important instruments were blown by gas engines. These had some advantages over hydraulic -- they could not, for example, flood the church, as once happened at Cirencester -- but their fumes were found, in the course of time, to cause serious damage to the leatherwork of the mechanism and to the pipes themselves.

Steam blowing was still confined to the very largest organs: the Royal Albert Hall, the Alexandra Palace, and St.George's Hall (where it was renewed at the 1897 rebuild — which would seem to denote that it was proving satisfactory. The Chester Cathedral organ of 1876 was originally gas blown; but when this for some reason proved a failure, steam was provided in its place.

It is good to be able to chronicle the arrival of electric blowing shortly before the end of our period; Lincoln Cathedral (1898) was, in fact, the first Cathedral organ to be blown by electricity, and was followed by Norwich Cathedral (1899). An eye-witness account of the opening of the new Lincoln organ shows how even Willis was not immune from the almost traditional custom of not having an organ quite ready in time for its inauguration. "The electric motors for working

1) the bellows had not been connected up, but the wind was supplied by relays of men of the Lincolnshire Regiment under a sergeant. I well remember catching sight of their red jackets....in the triforium. Blowing twenty inches of wind by hand could have been no light matter, but they were most efficient and kept the wind absolutely steady throughout......."

Pitch.

Here, too, it is possible to bring the century to a happy ending. During the seventies and eighties, the high "Concert pitch" prevailed; the Sheldonian Theatre, Oxford (Willis, 1877) had a C of 540 vibrations; and St.Luke's, Chelsea (Henry Jones, 1878) went as

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1. George Dixon, in Org.23.43

high as C 545, practically a semitone higher than the French diapason normal. Willis brought his pitch down to C 528 at Canterbury in 1886, but the firm of Hill (with one notable exception) persisted with the high pitch of 535-538 until Peterborough (1894). The exception was Birmingham Town Hall, where the 1890 rebuild adopted what we now call the New Philharmonic Pitch of A 439 (equivalent to C 522).

The official blessing in 1896 by the Royal Philharmonic Society of the French Normal Diapason had a welcome effect on organbuilding. In the final years of the century, new organs were regularly conforming with the agreed standard (such as Lincoln, St.Bees, Liverpool Philharmonic Hall); and older organs were being converted (for instance St.Paul's Cathedral and Leeds Town Hall)

Lincoln indeed went slightly lower, down to C 512, the so-called Viennese pitch, but was restored to the Diapason Normal of C 517 in 1907. It must be remembered that the New Philharmonic (A 439, C 522 at 68 degrees Fahrenheit) is no more than the French Diapason Normal (A 435, C 517.8 at 59 degrees) raised to a temperature nearer to that of a concert-hall, with its crowded audience and its artificial lighting. It may be pointed out also that a fairly large change of pitch in an organ is quite a major operation; lowering to any extent will involve transposing all the pipes, replacing them on the soundboards one hole up, and adding a new bottom pipe -- the old top pipe being scrapped. Then there would still remain the complete re-tuning to be done, as the amount of alteration was never an exact semitone.

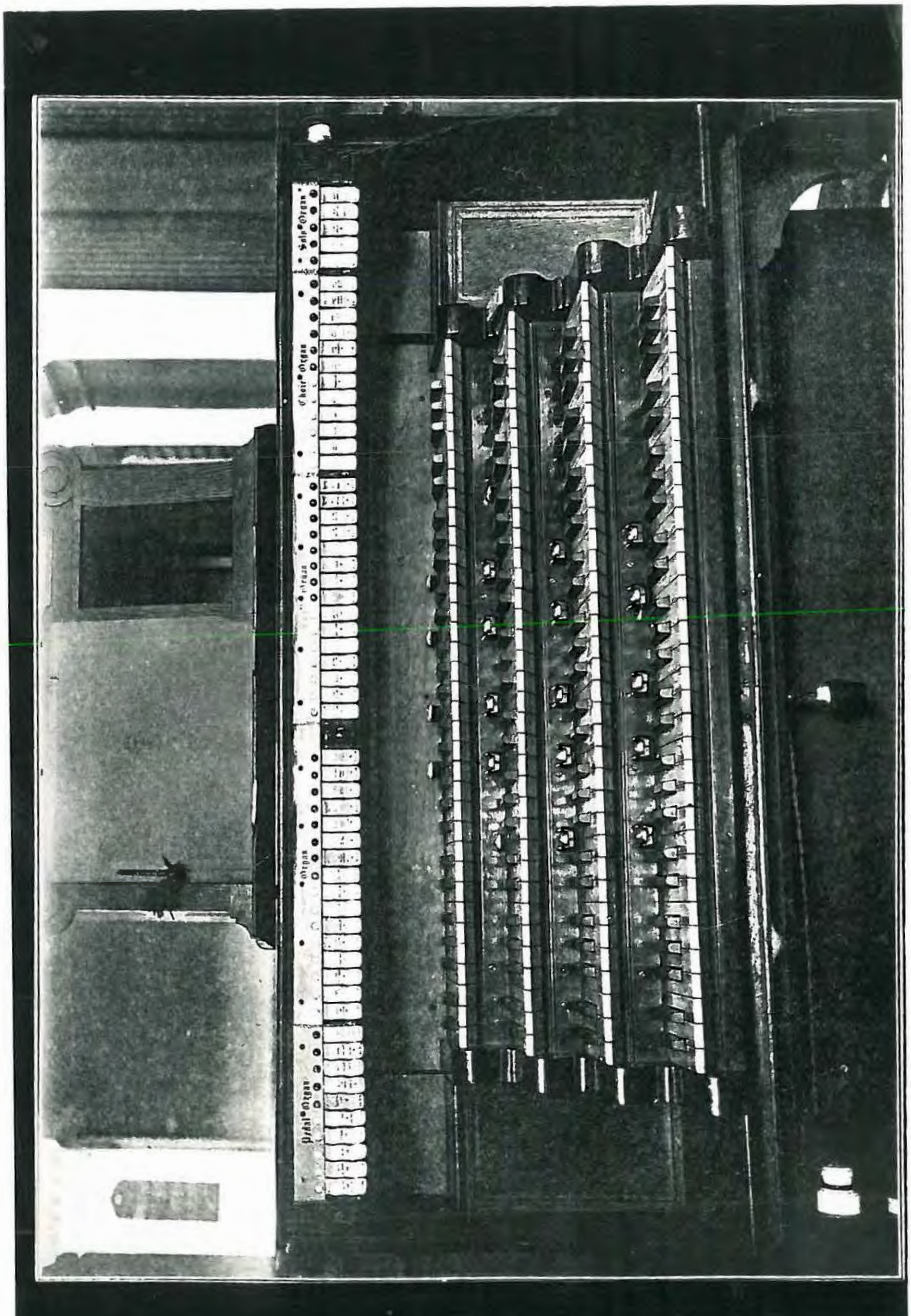
Solo Organ
Choir Organ
Pedal Organ

PLATE XVIII.

A typical Hope-Jones console.

The organ in St.George's Church, Hanover Square, London, was built by Hope-Jones in 1895, and this photograph shows some of the innovations he incorporated in his consoles. The stop-keys are of the vertical "rocking-tablet" variety, brought "on" by a push at the lower end, and "off" by a pull. Over each stop is a coloured stud (white for flues, red for reeds and black for couplers). In place of thumb-pistons, there are "compound composition keys", fully described on pages 453 and 454.

(Photograph from Org.4.35, by Gilbert Benham)

SPECIFICATIONS

(to illustrate Chapter Four)

1. SALISBURY CATHEDRAL — Willis, 1876

Great(14 stops)

Dble.open diapason	16
Open diapason I	8
Open diapason II	8
Stopped diapason	8
Claribel flute(mid.C)	8
Harmonic flute	4
Principal	4
Twelfth	2 2/3
Fifteenth	2
Piccolo	2
Mixture	IV
Double trumpet	16
Trumpet	8
Clarion	4

Swell(14 stops)

Contra gamba(ten.C)	16
Diapason	8
Lieblich gedact	8
Viol di gamba	8
Vox angelica	8
Flute harmonique	4
Octave	4
Superoctave	2
Mixture	III
Oboe	8
Vox humana	8
Contra fagotto	16
Cornopean	8
Clarion	4

Choir(10 stops)

Lieblich bourdon	16
Flute harmonique	8
Lieblich gedact	8
Salicional	8
Lieblich flöte	4
Flute harmonique	4
Gemshorn	4
Flageolet	2
Cor anglais	8
Corno di bassetto	8

Solo(6 stops)

Flute harmonique	8
Flute harmonique	4
Orchestral oboe	8
Corno di bassetto	8
Tuba	8
Tuba clarion	4

Couplers

Sw.to Gt.
Solo to Gt.
Ch.to Gt.
Sw.to Ped.
Gt.to Ped.
Ch.to Ped.
Solo to Ped.
Sw.to Gt.oct.
Sw.to Gt.suboct.

Pedal(11 stops)

Dble.open diapason	32
Open diapason	16
Open wood	16
Violone	16
Bourdon	16
Flute	8
Octave	8
Mixture	III
Contra posaune	32
Ophicleide	16
Clarion	8

Accessories

4 pistons to each manual
4 composition pedals to Pedal.
Ped.to Gt.pistons
Tremolo pedal
Gt.to Ped.reversible
Lever Swell-pedal

Wind-Pressures

Gt: flues 3½" & 4"; reeds 8"
Sw: 4½" throughout
Ch: 2¾" throughout
Solo: 4" throughout, except Tuba – 14"bass, 17"treble
Ped: flues 2", 3" & 4"; reeds 8"

(Specifications -- Chapter Four -- continued)

2. CHESTER CATHEDRAL -- Whiteley, 1876

Great(17 stops)

Dble.open diapason	16
Contra gamba	16
Bourdon	16
Open diapason,major	8
Open diapason,minor	8
Flute a pavillon	8
Stopped diapason	8
Harmonic flute	8
Principal	4
Harmonic flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	IV
Furniture	V
Contra posaune	16
Tromba	8
Clarion	4

Couplers

Sw.oct.
Sw.suboct.
Sw.to Gt.
Sw.to Ch.
Solo suboct.
Solo to Gt.
Solo to Ped.
Sw.to Ped.
Gt.to Ped.
Ch.to Ped.

Swell(13 stops)

Bourdon	16
Open diapason	8
Viola da gamba	8
Stopped diapason	8
Principal	4
Suabe flöte	4
Fifteenth	2
Mixture	IV/V
Contra fagotto	16
Cornopean	8
Trumpet	8
Oboe	8
Clarion	4

Pedal(10 stops)

Dble.open diapason	32
Open diapason	16
Violone	16
Sub-bass	16
Quint	10 2/3
Octave	8
Violoncello	8
Fifteenth	4
Trombone	16
Bombarde	8

Choir(10 stops)

Dble.dulciana	16
Open diapason	8
Pierced gamba (ten.C)	8
Salicional	8
Clarabella(ten.C)	8
Stopped diapason	8
Principal	4
Stopped flute	4
Piccolo	2
Clarinet	8

Echo & Solo(12 stops)

(enclosed)

Lieblich bourdon	16
Flute harmonique	8
Lieblich gedact	8
Vox angelica(ten.C)	8
Lieblich flöte	4
Flautina	2
Vox humana	8

(unenclosed)

Orchestral trumpet (ten.C)	8
Tuba mirabilis	8

(borrowed from Gt.)

Diapason harmonic	8
Harmonic flute	4
Tromba	8

Composition pedals -- 5 to Gt. & Ped.
4 to Sw.

Double-acting pedal for Sw. octave couplers.

(Specifications -- Chapter Four -- continued)

3. ST.MARTIN'S CHURCH, SCARBOROUGH -- Harrison, 1877

Great(13 stops)

Contra salicional	16
Large open diap.	8
Small open diapa	8
Bell gamba	8
Stopped diapason	8
Principal	4
Flute harmonique	4
Twelfth	2 2/3
Fifteenth	2
Harmonic piccolo	2
Sesquialtera	IV
Tuba	8
Clarion	4

Couplers

Sw.to Gt.
Sw.to Gt.oct.
Sw.to Gt.suboct.
Ch.to Gt.
Sw.to Ch.
Echo to Ch.
Ch.to Ped.
Sw.to Ped.
Gt.to Ped.
Echo to Ped.
Sw.oct.
Sw.suboct.

Swell(13 stops)

Bourdon	16
Open diapason	8
Stopped diapason	8
Salicional	8
Voix celeste	8
Principal	4
Fifteenth	2
Sesquialtera	III
Mixture	II
Contra fagotto	16
Cornopean	8
Hautboy	8
Trumpet	4

Pedal(13 stops)

Open diapason	16
Open diapason	16
Violone	16
Bourdon	16
Open quint	12
Principal	8
Violoncello	8
Flute	8
Twelfth	6
Fifteenth	4
Twenty-second	2
Trombone	16
Posaune	8

Choir(11 stops)

Dulciana	8
Lieblich gedact	8
Clarabella	8
Viol di gamba	8
Keraulophon	8
Salicet	4
Flute	4
Fifteenth	2
Flageolet	2
Orchestral oboe	8
Cremona	8

Echo(5 stops)

Echo dulcis	8
Orphiangeon(?)	8
Flute	4
Oboe	8
Vox humana	8

Accessories

Composition pedals:
3 Gt., 3 Sw.,
3 Ch., 3 Ped.

Coupler piston to each manual (reversing position of Pedal coupler)

3 pistons to Gt (reversing position of Ch.to Gt., Sw.to Gt., and Echo to Gt.)

1 piston:
Sw.on Gt., Gt.off.

(Specifications -- Chapter Four -- continued)

4. THE TEMPLE CHURCH, LONDON -- Forster and Andrews, 1878

Great(16 stops)

Dble.diap.(stopped)	16
Large open diapason	8
Small open diapason	8
Stopped diapason	8
Hohl flöte	8
Viola da gamba	8
Principal	4
Octave	4
Mason flute	4
Twelfth	2 2/3
Fifteenth	2
Full mixture	III
Sharp mixture	V
Large trumpet	8
Small trumpet	8
Clarion	4

Swell(16 stops)

Bourdon	16
Open diapason	8
Violin	8
Rohr gedact	8
Salicional	8
Voix celestes	8
Principal	4
Gambette	4
Rohr flöte	4
Twelfth/Fifteenth	II
Mixture	IV
Double bassoon	16
Horn	8
Oboe	8
Voix humaine	8
Clarion	4

Choir(11 stops)

Lieblich bourdon	8
Violin diapason	8
Lieblich gedact	8
Spitz flöte	8
Dulciana	8
Flauto traverso	8
Gemshorn	4
Violino	4
Lieblich flöte	4
Mixture	III
Corno di bassetto	8

Pedal(11 stops)

Sub-bass	32
Major bass	16
Open bass	16
Violon	16
Stopped bass	16
Quint	10 2/3
Violoncello	8
Principal	8
Tenor solo	4
Treble solo	2
Trombone	16

Couplers(drawstops)

Sw.to Gt.
Sw.to Ch.
Ch.suboct.to Gt.
Solo to Gt.
Solo to Ped.
Sw.to Ped.
Gt.to Ped.
Ch.to Ped.
Ped.Oct.
Tremulant

Solo(6 stops)

Flute harmonique	8
Flute octaviante	4
Piccolo harmonique	2
Tuba	8
Clarinet	8
Orchestral oboe	8

Accessories(pedals)

Soft pedal organ.
Reversibles: Sw.to Gt.
Gt.to Ped.
Tremulant
3 composition pedals to Sw.
5 composition pedals to Gt. & Ped.

5. ST.PATRICK'S CATHEDRAL, DUBLIN -- Telford, 1882

Great(15 stops)

(Double bass / Double diapason)	16
Open diapason, No.1	8
Open diapason, No.2	8
Stopped diapason	8
Gamba	8
Claribel	8
Principal	4
Flute harmonic	4
Sexquialtera	III/IV
Sharp mixture	III/IV
Mixture	II
Double trumpet	16
Trumpet	8
Clarion	4

Couplers

Solo to Gt. (knob under Gt.manual)
Sw.to Gt.
Sw.to Ped.
Gt.to Ped.
Ch.to Ped.

Swell(14 stops)

(Bourdon / Double diapason)	16
Open diapason	8
Salicional	8
Stopped diapason	8
Principal	4
Flute	4
Mixture	III/IV
Sexquialtera	III/IV
Double trumpet	16
Cornopean	8
Oboe	8
Clarion	4
Vox humana	8

Pedal(7 stops)

Sub-bass	32
Double diapason	16
Violone	16
Quint	10 2/3
Unison	8
Bombarde	16
Trombone	8

Choir(10 stops)

Open diapason	8
Stopt diapason	8
Dulciana	8
Viol di gamba	8
Wald flöte	8
Claribel flute	4
Principal	4
Piccolo	2
Bassoon	16
Clarinet	8

Solo(10 stops)

String gamba	8
Hohl flöte	8
Flute harmonic	4
Piccolo	2
Glockenspiel	
Contra fagotto	16
French horn	8
Orchestral oboe	8
Clarinet	8
Tuba mirabilis	8

7 composition pedals.

Wind-pressures from 5" to 10".

(Specifications -- Chapter Four -- continued)

6. WESTMINSTER ABBEY -- Hill, 1884

Great(13 stops)

Dble.open diapason	16
Open diapason, No.1	8
Open diapason, No.2	8
Open diapason, No.3	8
Hohl flute	8
Principal	4
Harmonic flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	IV
Double trumpet	16
Posaune	8
Clarion	4

Couplers

Gt.to Ped.(duplicated)
Sw.to Ped.
Ch.to Ped.
Solo to Ped.
Solo oct.to Ped.
Sw.to Gt.
Solo to Gt.
Sw.to Ch.
Sw.Oct.
Sw.tremulant
Solo tremulant

Swell(14 stops)

Double diapason	16
Open diapason	8
Dulciana	8
Salicional	8
Vox angelica	8
Stopped diapason	8
Principal	4
Dulcet	4
Fifteenth	2
Mixture	III
Double trumpet	16
Cornopean	8
Oboe	8
Clarion	4

Solo(8 stops)

Gamba	8
Rohr flute	8
Lieblich flute	4
Harmonic flute	4
*Orchestral oboe	8
*Clarionet	8
*Vox humana	8
Tuba mirabilis	8

(*enclosed)

Composition pedals

4 Gt., 4 Sw., 2 Ped.

Choir(11 stops)

Bourdon	16
Open diapason	8
Dulciana	8
Keraulophon	8
Lieblich gedact	8
Principal	4
Nason flute	4
Suabe flute	4
Harmonic gemshorn	2
Bassoon	16
Cor anglais	8

Pedal(10 stops)

Dble.open diapason	32
Open diapason	16
Open diapason	16
Bourdon	16
Principal	8
Violoncello	8
Bass flute	8
Contra posaune	32
Posaune	16
Trumpet	8

Reversibles

Gt.to Ped.
Solo to Gt.

Celestial Organ (added in 1895 -- together with Sw. Open diapason, Rohr flute, Gedact.)

(A) Accompanimental

Dble.dulciana(bass)	16
Dble.dulciana(treble)	16
Flauto traverso	8
Viola da gamba	8
Voix celestes	8
Lieblich gedackt	8
Hohl flute	8
Dulciana cornet	VI

(B) Solo

Suabe flute	4
Flageolet	2
Glockenspiel	III
Cor de nuit	8
Harmonic oboe	8
Harmonic trumpet	8
Musette	8
Vox humana	8
Gongs	8

Accessories

A to 5th manual; A to 4th
B to 5th manual; B to 4th
Celestial oct. to 5th man.
" subpct.to 5th man.
" oct.to 4th man.
" suboct.to 4th man.
" to Ped.
Tremulant

(Specifications -- Chapter Four -- continued)

7. LICHFIELD CATHEDRAL -- Hill, 1884

Great(15 stops)

Sub-bass(tenoroon)	16
Open diapason(large)	8
Open diapason	8
Stopped diapason	8
Clarabella	8
Bell gamba	8
Octave	4
Octave gamba	4
Harmonic flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	IV
Mixture	II
Grand posaune	8
Clarion	4

Couplers

Gt. to Ped.
Sw. to Ped.
Solo to Ped.
Ch. to Ped.
Solo to Gt.
Sw. to Gt.
Solo oct.
Sw. oct.
Sw. to Ch.
Ch. to Gt.

Swell(15 stops)

Bourdon	16
Open diapason	8
Pierced gamba	8
Voix celestes(ten.C)	8
Stopped diapason	8
Principal	4
Celestina flute	4
Fifteenth	2
Mixture	III
Mixture	II
Tromba	16
Trumpet	8
Cornopean	8
Oboe	8
Clarion	4

Solo(5 stops)

Harmonic flute	8
Concert flute	4
Orchestral oboe	8
Corno di bassetto	8
Tuba	8

Choir(9 stops)

Lieblich bourdon	16
Open diapason	8
Dulciana	8
Keraulophon	8
Stopped diapason	8
Principal	4
Wald flöte	4
Fifteenth	2
Cremona	8

Pedal(10 stops)

Dble.open diapason	32
Open diapason	16
Open diapason	16
Bourdon	16
Principal	8
Bass flute	8
Fifteenth	4
Mixture	IV
Trombone	16
Trumpet	8

Accessories

4 composition pedals to Gt.
4 " " to Sw.
1 reversible pedal: Gt. to Ped.

Tubular-pneumatic action to Gt., Sw., Ped.

Blowing by gas engine.

(Specifications -- Chapter Four -- continued)

8. BEVERLEY MINSTER -- Hill, 1885

Great (14 stops)

Dble.open diapason	16
Open diapason, No.1	8
Open diapason, No.2	8
Open diapason, No.3	8
Stopt diapason	8
Clarabella	8
Flute	4
Principal	4
Twelfth	3
Fifteenth	2
Sesquialtera	III
Furniture	IV
Posaune	8
Clarion	4

Swell (17 stops)

Bourdon	16
Open diapason	8
Gemshorn	8
Keraulophon	8
Vox angelica (ten.C)	8
Stopt diapason	8
Principal	4
Celestina	4
Gemshorn	4
Mazard	3
Fifteenth	2
Sesquialtera	IV
Double bassoon	16
Horn	8
Trumpet	8
Oboe	8
Clarion	4

Choir (9 stops)

Open diapason	8
Dulciana	8
Gamba (ten.C)	8
Stopt diapason	8
Flute	4
Principal	4
Fifteenth	2
Sesquialtera	III
Cromorne	8

Pedal (8 stops)

Dble.open diapason	32
Open diapason	16
Violone	16
Violoncello	8
Principal	8
Bass flute	8
Fifteenth	4
Grand posaune	16

Solo (8 stops)

Hohl flöte	8
Lieblich flöte	4
Flageolet	2
Cor anglais	8
"Orchestral oboe	8
"Vox humana	8
Tuba mirabilis	16
Tuba mirabilis	8

(" enclosed)

Accessories

Composition pedals:
4 Gt., 4 Sw., 2 Ped.

Gt. & Ch., pneumatic-lever action
Remainder, tubular-pneumatic

Hydraulic blowing.

Couplers

Sw.oct.	Ch.suboct.to Ped.
Sw.to Gt.	Gt.to Ped.
Sw.to Ch.	Sw.to Ped.
Solo to Gt.	Solo to Ped.
Ch.to Ped.	Tremulant

(Specifications -- Chapter Four -- continued)

9. TEWKESBURY ABBEY -- Michell and Thynne, 1885

Great (10 stops)		Swell (9 stops)		Choir (7 stops)	
Violone	16	Open diapason	8	Spitzflöte	8
Open diapason	8	Flauto traverso	8	Viole sourdine	8
Open diapason	8	Viole da gamba	8	Gedact	8
Claribel	8	Voix celeste	8	Gemshorn	4
Octave	4	Geigen	4	Zauberflöte	4
Flute octaviante	4	Mixture	III	Flautina	2
Quint mixture	II	Contra posaune	16	Clarinet	8
Great mixture	IV	Horn	8		
Trombone	16	Oboe	8		
Trumpet	8				

Pedal (5 stops)

Harmonic bass	32
Great bass	16
Dolce	16
Great flute	8
Bombarde	16

Solo (4 stops)

Harmonic flute
Violoncello
*Voix humaine
Tuba
(*enclosed)

Couplers

Solo superoct.
Sw. superoct.
Solo to Gt.
Sw. to Gt.
Ch. to Gt. suboct.
Sw. to Ch.
Ch. superoct.
Solo to Ped.
Sw. to Ped.
Gt. to Ped.
Ch. to Ped.
Tremulant Sw.
Tremulant Solo.

Ventils (by drawstop)

Gt. flues to quint mixture
Gt. mixture & reeds
Sw. flue & oboe
Sw. reeds
Wind to Ch.
Solo
Pedal minus dolce

Composition pedals: 4 Gt., 3 Sw.
Reversible Gt. to Ped.
Pneumatic pistons -- 7 controlling ventils, tube & bombarde.
Lever pedals for Sw. & Solo boxes (Solo voix humaine only)

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10. CANTERBURY CATHEDRAL -- Willis, 1886

Great (15 stops)				Choir (9 stops)	
Dble. open diapason	16	Twelfth	3	Lieblich gedackt	16
Open diapason, No. 1	8	Fifteenth	2	Open diapason	8
Open diapason, No. 2	8	Piccolo	2	Lieblich gedackt	8
Stopped diapason	8	Mixture	IV	Viola da gamba	8
Claribel flute	8	Double trumpet	16	Flauto traverso	8
Quint	6	Cornopean	8	Salicional	8
Principal	4	Clarion	4	Flute harmonique	4
Flute harmonique	4			Gemshorn	4
				Corno di bassetto	8

(continued overleaf)

(Specifications -- Chapter Four -- continued)

(Canterbury Cathedral -- continued)

Swell(13 stops)

Double diapason	16
Open diapason	8
Lieblich gedeckt	8
Salicional	8
Vox angelica	8
Octave	4
Flageolet	2
Mixture	III
Contra fagotto	16
Trumpet	8
Hautboy	8
Vox humana	8
Clarion	4

Solo(6 stops)

Flute harmonique	8
Concert flute	8
Orchestral oboe	8
Corno di bassetto	8
Tuba	8
Clarion	4

Accessories

4 pistons each manual.
Piston, Gt.to Ped.on
" Gt.to Ped.off
4 composition pedals to Ped.
1 reversible, Gt.to Ped.
Tremulant on Sw.& Ch.

Pedal(4 stops)

Open diapason	16
Bourdon	16
Flute(extended)	8
Posaune	16

Couplers

Sw.to Ped.	Gt.to Ped.
Solo to Ped.	Ch.to Ped.
Solo to Gt.	Ch.to Gt.
Sw.to Gt.suboct.	
Sw.to Gt.superoct.	
Sw.to Gt.	Sw.to Ch.

Electro-pneumatic action

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11. TRURO CATHEDRAL -- Willis, 1887

Great(12 stops)

Dble.open diapason	16
Open diapason	8
Open diapason	8
Claribel	8
Principal	4
Flute harmonique	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Double trumpet	16
Tromba	8
Clarion	4

Pedal(7 stops)

Dble.open diapason	32
Open diapason	16
Violone	16
Bourdon	16

Swell(13 stops)

Geigen principal	16
Open diapason	8
Lieblich gedact	8
Echo gamba	8
Vox angelica	8
Geigen principal	4
Flageolet	2
Mixture	III
Contra fagotto	16
Hautboy	8
Vox humana	8
Cornopean	8
Clarion	4

- - - - - - - - - -

Octave	8
Violoncello	8
Ophicleide	16

Choir(8 stops)

Gamba	8
Dulciana	8
Lieblich gedact	8
Hohl flöte	8
Lieblich flöte	4
Gemshorn	4
Piccolo	2
Corno di bassetto	8

Solo(5 stops)

Harmonic flute	8
Concert flute	4
Orchestral oboe	8
Clarinet	8
Tuba	8

(continued overleaf)

(Specifications -- Chapter Four -- continued)

(Truro Cathedral -- continued)

Couplers

Sw.to Ch. Ch.to Gt.
Ch.to Ped. Solo to Gt.
Gt.to Ped. Sw.to Gt.
Sw.to Ped. Sw.to Gt.oct.
Solo to Ped. Sw.to Gt.suboct.

Accessories

4 pistons each to Gt. & to Sw.
Piston: Sw.to Gt. on
" Sw.to Gt. off
" Gt.to Ped. on
" Gt. to Ped.off
Reversible pedal: Gt.to Ped.
Duplicating composition pedals.
Lever Swell-pedal

Wind-pressures

All 4" -- except: 1st 4 & last 2 Gt. } 7"
Sw.fagotto,cornopean,clarion }
Solo tuba & Ped. ophicleide 15"

Action: tubular-pneumatic, except Choir (tracker). Hydraulic blowing.

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12. ST.GILES' CATHEDRAL, EDINBURGH -- Harrison, 1887

Great(16 stops)

Contra gamba	16
Bourdon	16
Open diapason(large)	8
Open diapason(small)	8
Gamba	8
Clarabella	8
Principal	4
Octave gamba	4
Flute harmonique	4
Twelfth	2 2/3
Fifteenth	2
Mixture	IV
Mixture	III
Double trumpet	16
Trumpet	8
Clarion	4

Couplers

Sw.to Gt. Solo to Gt.
Sw.to Ch. Solo to Ped.
Ch.to Gt. Sw.to Gt.oct.
Ch.to Ped. Solo to Gt.oct.
Sw.to Ped. Ch.to Gt.sub.
Gt.to Ped.

Swell(16 stops)

Double diapason	16
Open diapason	8
Viola	8
Salicional	8
Lieblich gedackt	8
Voix celeste	8
Principal	4
Suabe flute	4
Fifteenth	2
Piccolo harmonique	2
Mixture	V
Contra oboe	16
Horn	8
Cornopean	8
Oboe	8
Clarion	4

Solo(6 stops)

Concert flute	8
Concert flute(harm.)	4
Great tuba	8
Octave tuba	4
Vox humana(encl.)	8
Oboe (orch.)	8

Choir(11 stops)

Lieblich gedackt	16
Open diapason	8
Dulciana	8
Viol di gamba	8
Lieblich gedackt	8
Rohlflöte	8
Gemshorn	4
Octave gamba	4
Lieblich flute	4
Flageolet	2
Clarinet(orch.)	8

Pedal(11 stops)

Dble.open diapason	32
Open diapason	16
Violone	16
Bourdon	16
Quint	10 2/3
Violoncello	8
Flute	8
Sesquialtera	III
Trombone	16
Contra fagotto	16
Posaune	8

(continued overleaf)

(Specifications -- Chapter Four -- continued)

(St.Giles', Edinburgh -- continued)

Accessories

Composition pedals: 6 Gt., 4 Sw., 3 Ch., 4 Ped.
6 patent pneumatic coupling pistons "which enable the player to bring on and throw off the whole power of the instrument without removing his hands from the keys".

Action

Gt. & Sw., pneumatic-lever, improved (builders' patent)
Ch. & Solo, tracker with patent valves for lightness
Ped. & drawstops, tubular-pneumatic

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13. KING'S COLLEGE, CAMBRIDGE -- Hill, 1889

Great(16 stops)

Dble.open diapason	16
Open diapason(east)	8
Open diapason(west)	8
Viola	8
Stopped diapason	8
Hohl flöte(ten.C)	8
Octave	4
Harmonic flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	II
Mixture	III
Double trumpet	16
Posaune	8
Trumpet	8
Clarion	4

Swell(12 stops)

Bourdon	16
Open diapason	8
Gamba	8
Voix celeste(ten.C)	8
Stopped diapason	8
Principal	4
Fifteenth	2
Mixture	III
Double trumpet	16
Horn	8
Oboe	8
Clarion	4

Pedal(8 stops)

Dble.open diapason	32
Open diapason	16
Violone	16
Bourdon	16
Violoncello	8
Flute	8
Trombone	16
Trumpet	8

Solo(10 stops)

Viola di gamba	8
Rohr flöte	8
Harmonic flute	4
Mason flute	4
Viola di gamba	4
"Cormorne	16
"Orchestral oboe	8
"Cor anglais	8
Contra tube	16
Tube	8

(" enclosed)

Choir(9 stops)

Lieblich bourdon	16
Open diapason	8
Viol di gamba	8
Dulciana	8
Stopped diapason	8
Principal	4
Suabe flute	4
Harmonic gemshorn	2
Clarinet	8

Couplers:

Sw.to Gt.
Ch.to Gt.
Sw.to Ch.
Sw.to Ped.
Ch.to Ped.
Solo to Gt.
Solo to Ped.
Solo oct.to Gt.
Gt.to Ped.

Accessories: Pistons -- 4 Gt., 3 Sw. Composition pedals -- 4 Gt., 3 Sw., 3 Solo.

Balanced swell-pedals to Sw. & Solo

(Specifications -- Chapter Four -- continued)

14. SOUTHWELL CATHEDRAL -- Bishop, 1890

Great(13 stops)

Dble.open diapason	16
Open diapason(large)	8
Open diapason(small)	8
Stopped diapason	8
Clarabella	8
Principal	4
Harmonic flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	IV
Double trumpet	16
Trumpet	8
Clarion	4

Couplers

Solo to Sw.
Solo to Ped.
Sw.to Gt.
Sw.to Ch.
Sw.oct.
Solo to Gt.
Sw.to Ped.
Ch.to Gt.
Gt.to Ped.(right)
Gt.to Ped.(left)
Ch.to Ped.

Swell(15 stops)

Double diapason	16
Open diapason	8
Viola	8
Stopped diapason	8
Vox angelica	8
Voix celeste	8
Principal	4
Flautina	2
Mixture	IV
Contra fagotto	16
Cornopean	8
Trumpet	8
Oboe	8
Vox humana	8
Clarion	4

Solo(4 stops)

Harmonic flute	8
Concert flute	4
Orchestral oboe	8
Tuba mirabilis	8

Accessories

Pistons: 4 Gt., 4 Sw., 3 Ch.
Pedals: 3 for couplers
1 full-organ
1 reversible Gt.to Ped.
Sw.tremulant

Choir(9 stops)

Lieblich bourdon	16
Open diapason	8
Viol di gamba	8
Dulciana	8
Stopped diapason	8
Principal	4
Flauto traverso	4
Piccolo	2
Clarinet	8

Pedal(13 stops)

Dble.open diapason	32
Contra bourdon	32
Open diapason	16
Violone	16
Bourdon	16
Quinte	10 2/3
Principal	8
Flute	8
Violoncello	8
Fifteenth	4
Bombarde	16
Trumpet	8
Clarion	8

Wind-pressures:

Sw.flues, Ch., Ped.	3"
Gt.	4"
Sw.reeds	6"
Solo	10"

(Specifications -- Chapter Four -- continued)

15. SYDNEY TOWN HALL, AUSTRALIA -- Hill, 1890

Great(28 stops)

Contrabourdon	32
Bourdon	16
Dble.open diapason	16
Open diapason, No.1	8
Open diapason, No.2	8
Open diapason, No.3	8
Open diapason, No.4	8
Harmonic flute	8
Viola	8
Spitzflöte	8
Gamba	8
Hohl flöte	8
Rohr flöte	8
Quint	5 1/3
Harmonic flute	4
Principal	4
Octave	4
Gemshorn	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Cymbal	IV
Sharp mixture	IV
Furniture	V
Contra posaune	16
Posaune	8
Trumpet	8
Clarion	4

Swell(24 stops)

Dble.open diapason	16
Bourdon	16
Open diapason	8
Viol di gamba	8
Salicional	8
Dulciana	8
Vox angelica	8
Hohl flöte	8
Octave	4
Gemshorn	4
Harmonic flute	4
Rohr flöte	4
Twelfth	2 2/3
Fifteenth	2
Harmonic piccolo	1
Mixture	IV
Furniture	V
Trombone	16
Bassoon	16
Horn	8
Cornopean	8
Oboe	8
Clarion	4
Vox humana	8

Choir(20 stops)

Contra dulciana	16
Open diapason	8
Gamba	8
Dulciana	8
Flauto traverso	8
Hohl flöte	8
Lieblich gedackt	8
Octave	4
Violina	8
Voix celeste	8
Lieblich flöte	4
Twelfth	2 2/3
Fifteenth	2
Dulcet	2
Dulciana mixture	III
Bassoon	16
Trumpet	8
Clarinet	8
Oboe	8
Octave oboe	4

Solo(20 stops)

Quintaton	16
Open diapason	8
Violin diapason	8
Flauto traverso	8
Doppel flöte	8
Stopped diapason	8
Viola	8
Octave	4
Flauto traverso	4
Harmonic flute	4
Flauto traverso	2
Contra fagotto	16
Cor anglais	8
Corno di bassetto	8
Orchestral oboe	8
Harmonic trumpet	8
Octave oboe	4
Contra tuba	16
Tuba	8
Clarion	4

Echo(8 stops)

Viol d'amour	8
Unda maris(II rks)	8
Lieblich gedackt	8
Viol d'amour	4
Flageolet	2
Glockenspiel	IV
Echo dulciana cornet	IV
Basset horn	8

(continued overleaf)

(Specifications -- Chapter Four -- continued)

(Sydney Town Hall -- continued)

Pedal(26 stops)

Dble.open diapason	32	Bass flute	8
Dble.open diapason	32	Twelfth	5 1/3
Contre bourdon	32	Fifteenth	4
Open diapason	16	Mixture	II
Open diapason	16	Mixture	III
Violone	16	Mixture	IV
Gamba	16	Contra trombone	64
Dulciana	16	Contra posaune	32
Bourdon	16	Posaune	16
Quint	10 2/3	Trombone	16
Octave	8	Bassoon	16
Prestant	8	Trumpet	8
Violoncello	8	Clarion	4

Lever Swell-pedals to Sw., and to Ch.reeds.
Blowing by gas.

Couplers

Gt.to Ped.	Solo to Gt.
Sw.to Gt.	Solo to Ped.
Ch.to Gt.	Solo to Ch.
Ch.to Ped.	Solo oct.
Sw.to Ped.	Echo to Sw.
Sw.to Ch.	Ped.to Gt.pistons
Sw.oct.	Sw.suboct.

Accessories

Pistons: 8 Gt., 8 Sw., 7 Ch., 7 Solo, 3 Echo.
Pedals: 6 Ped., 4 Gt. 3 for Ped.couplers
Sw.tremulant
Ch.tremulant

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16. EXETER CATHEDRAL -- Willis, 1891

Great(15 stops)

Dble.open diapason	16
Open diapason,No.1	8
Open diapason,No.2	8
Open diapason,No.3	8
Stopped diapason	8
Claribel flute	8
Principal	4
Harmonic flute	4
Octave	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Double trumpet	16
Trumpet	8
Clarion	4

Swell(14 stops)

Dble.stopped diapason	16
Open diapason	8
Stopped diapason	8
Echo gamba	8
Voix celestes	8
Principal	4
Celestina	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Contra fagotto	16
Cornopean	8
Hautboy	8
Clarion	4

Choir(10 stops)

Lieblich bourdon	16
Salicional	8
Vox angelica(ten.C)	8
Lieblich gedackt	8
Salicet	4
Lieblich flöte	4
Lieblich piccolo	2
*Vox humana	8
*Corno di bassetto	8
*Orchestral oboe	8

(* enclosed)

(continued overleaf)

(Specifications -- Chapter Four -- continued)

(Exeter Cathedral -- continued)

Solo(10 stops)		Pedal(8 stops)		Couplers	
Dulciana	8	Contra violine	32	Sw.oct.	Solo to Gt.
Gamba	8	Open diapason	16	Sw.suboct.	Solo to Ch.
Claribel flute	8	Violone	16	Sw.to Gt.	Solo to Ped.
Wald flute	4	Bourdon	16	Sw.to Ch.	Ch.flues(ventil)
Gemshorn	4	Octave	8	Gt.to Ped.	Ch.reeds(ventil
Harmonic flute	4	Violoncello	8	Ch.to Ped.	
Viola	4	Bass flute	8		
Piccolo	2	Trombone	16		
Tuba	8				
Clarinet	8				

Accessories

Composition pedals:
5 Gt. & Ped. 4 Sw.
Tremulants to Sw. & Ch.

Reversible knee-piston & thumb-piston: Gt.to Ped.
Reversible knee-piston & thumb-pistob: Ventil,all Ped.except Bourdon
Swell-pedals to Sw. & Ch."

Wind-pressures: All 3½", except:
Gt.reeds & Sw.cornopean,clarion: 9"
Solo tuba & Ped.trombone: 15"

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17. HOLY TRINITY, SLOANE STREET, CHELSEA -- Walker, 1891

Great(14 stops)		Swell(14 stops)		Choir(7 stops)	
Open diapason	16	Double diapason	16	Open diapason	8
Open diapason,No.1	8	Open diapason	8	Gamba	8
Open diapason,No.2	8	Horn diapason	8	Dulciana	8
Open diapason,No.3	8	Stopped diapason	8	Lieblich gedackt	8
Salicional	8	Echo gamba	8	Gemshorn	4
Wald flöte	8	Voix celestes	8	Flute	4
Principal	4	Principal	4	Harmonic gemshorn	2
Harmonic flute	4	Flute	4		
Twelfth	2 2/3	Fifteenth	2	**Solo(9 stops)**	
Fifteenth	2	Mixture	IV		
Mixture	III	Double trumpet	16	Horn flute	8
Double trumpet	16	Horn	8	Echo dulciana	8
Trumpet	8	Hautboy	8	Vox angelica	8
Clarion mixture	III	Clarion mixture	III	Lieblich flöte	4
				Harmonic piccolo	2
Pedal(6 stops)				Vox humana	8
				Orchestral oboe	8
Double open	32	Bourdon	16	Clarinet	8
Open diapason	16	Violoncello	8	Tuba	8
Open diapason	16	Trombone	16		

(continued overleaf)

(Specifications -- Chapter Four -- continued)

(Holy Trinity, Sloane Street -- continued)

Couplers	Accessories	Wind pressures
7 unison couplers	Composition pedals:	Gt., $4\frac{1}{2}$", except reeds & salicional
Sw.oct.	5 Gt.& Ped., 4 Sw.	
Ch.oct.	Pistons:	
Ped.oct.	5 Gt., 4 Sw., 4 Solo.	Sw.& Gt.reeds & salicional, $5\frac{1}{2}$"
Gt.pistons to Ped.		
Sw.tremulant		Ch., 4"
Solo tremulant		Ped.trombone $9\frac{1}{2}$"
		Solo tuba 12"

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18. HEREFORD CATHEDRAL -- Willis, 1892

Great(16 stops)		Swell(14 stops)		Choir(9 stops)	
Double diapason	16	Contre gamba	16	Bourdon	16
Bourdon	16	Open diapason	8	Dulciana	8
Open diapason	8	Stopped diapason	8	Spitzflöte	8
Open diapason	8	Salicional	8	Lieblich gedackt	8
Open diapason	8	Vox angelica	8	Claribel	8
Gamba	8	Principal	4	Gemshorn	4
Stopped diapason	8	Lieblich flöte	4	Lieblich flöte	4
Claribel	8	Fifteenth	2	Piccolo	2
Principal	4	Mixture	III		
Harmonic flute	4	Double trumpet	16	**Solo(3 stops)**	
Twelfth	2 2/3	Trumpet	8		
Fifteenth	2	Hautboy	8	Harmonic flute	8
Mixture	III	Clarion	4	Harmonic flute	4
Double trumpet	16	Vox humana	8	Tuba	8
Trumpet	8				
Clarion	4	**Pedal(8 stops)**		**Echo(7 stops)**	

Couplers	Pedal(8 stops)		Echo(7 stops)	
	Double diapason	32	Viola da gamba	8
	Open diapason	16	Voix celestes	8
Sw.to Gt. Sw.to Ped.	Violone	16	Rohl flöte	4
Ch.to Gt. Gt.to Ped.	Bourdon	16	Clarinet(*)	8
Sw.to Ch. Ch.to Ped.	Violoncello	8	Orchestral oboe(*)	8
Solo to Gt.	Octave	8	Glockenspiel(gongs)	4
Solo suboct.	Trombone	16	Tromba(*)	8
Solo unison-off	Trumpet	8	(Echo on 4th manual, with Solo. Stops marked (*) have 16ft extensions)	
Sw.oct. Sw.suboct.				
Solo to Ped.				

Accessories: Pistons(adjustable) -- 6 Gt., 4 Sw., 3 Ch., 3 Echo/Solo.
6 composition pedals. Gt.pistons to combinations
Pedal to compositions Sw. " " "
Hydraulic blowing. Ch. " " "

(Specifications -- Chapter Four -- continued)

19. PETERBOROUGH CATHEDRAL -- Hill, 1894

Great(17 stops)		Swell(17 stops)		Choir(11 stops)	
Dble-open diapason	16	Bourdon	16	Gedeckt	16
Open diapason, No.1	8	Open diapason	8	Open diapason	8
Open diapason, No.2	8	Violoncello	8	Cone gamba	8
Open diapason, No.3	8	Salicional	8	Dulciana	8
Spitz flöte	8	Voix celestes	8	Keraulophon	8
Hohl flöte	8	Stopped diapason	8	Stopped diapason	8
Stopped diapason	8	Principal	4	Zaube flöte	4
Geigen principal	4	Salicet	4	Dulcet	4
Octave	4	Wald flöte	4	Flautina	2
Harmonic flute	4	Fifteenth	2	Contra fagotto	16
Twelfth	3	Mixture	III	Cor anglais	8
Fifteenth	2	Cymbal	IV		
Sharp mixture	III	Double trumpet	16	Solo(11 stops)	
Full mixture	IV	Horn	8		
Contra posaune	16	Oboe	8	Quintetön	8
Posaune	8	Trumpet	8	Viola	8
Clarion	4	Clarion	4	Rohr flöte	8
				Unda maris, II rks	8
Pedal(12 stops)				Flauto traverso	4
				Harmonic piccolo	2
Dble-open diapason	32	Violoncello	8	Contra bassoon	16
Open diapason	16	Bass flute	8	*Orchestral oboe	8
Open diapason	16	Twelfth/Fifteenth	II	*Clarinet	8
Violone	16	Contra trombone	32	*Vox humana	8
Bourdon	16	Posaune	16	*Tuba	8
Principal	8	Trumpet	8	(* enclosed)	

Accessories, etc. Couplers, 11; Pistons, 22; Composition pedals, 10;
Coupler pistons, 3; Solo tremulant;
Balanced swell-pedals:- Sw.(central), Ch. & Solo (on right)

Wind-pressures:
Gt - flues $3\frac{1}{2}$", reeds $6\frac{1}{2}$"
Sw - flues 3", reeds 4"
Ch - throughout 3"
Solo - $3\frac{1}{2}$", except tuba 12"
Ped - flues 3" & $3\frac{1}{2}$", reeds 6"

20. ST. MATTHEW'S CHURCH, NORTHAMPTON -- Walker, 1895

Great (13 stops)

Dble.open diapason	16
Open diapason	8
Open diapason	8
Open diapason	8
Wald flute	8
Wald flute	4
Principal	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Double trumpet	16
Trumpet	8
Clarion	4

Swell (15 stops)

Contra gamba	16
Open diapason	8
Violin diapason	8
Stopped diapason	8
Echo gamba	8
Vox angelica	8
Principal	4
Flute	4
Fifteenth	2
Mixture	III
Contra fagotto	16
Horn	8
Oboe	8
Vox humana	8
Clarion	4

Choir (7 stops)

Lieblich bourdon	16
Gamba	8
Dulciana	8
Lieblich gedact	8
Lieblich flute	4
Dulciana principal	4
Harmonic gemshorn	2

Solo (6 stops)

Harmonic flute	8
Harmonic flute	4
Harmonic piccolo	2
Orchestral oboe	8
Clarinet	8
Tuba	8

Pedal (7 stops)

Dble.open diapason	32
Open diapason (ext.)	16
Violone	16
Bourdon	16
Principal	8
Flute	8
Trombone	16

Couplers

Gt.to Ped.
Sw.to Ped.
Ch.to Ped.
Sw.to Gt.
Sw.to Ch.
Ch.to Gt.
Solo to Ped.
Sw.suboct.
Sw.oct.
Solo to Gt.
Gt.pistons to composition pedals.

Accessories

Pistons:
5 Gt., 5 Sw., 4 Solo.
Composition pedals:
4 Ped., 4 Sw.
(all adjustable, some at console, some at panel)

Wind-pressures

Gt	diapason chorus	4½"
	reeds, mixture, twelfth, fifteenth	6½"
Sw	diapason chorus & chorus reeds	6½"
	remainder	4"
Ch	throughout	3½"
Solo	all except tuba	6½"
	tuba	10"
Ped	flues	4½"
	reeds	7½"

(Specifications -- Chapter Four -- continued)

21. CASTLE HOUSE, CALNE -- Conacher, 1896

Great (7 stops)		Swell (8 stops)		Choir (7 stops)	
Bourdon	16	Open diapason	8	Violin diapason	8
Open diapason	8	Stopped diapason	8	Lieblich gedact	8
Stopped diapason	8	Viol d'orchestre	8	Dulciana	8
Gamba	8	Principal	4	Flauto traverso	4
Suabe flöte	4	Mixture	III	Flautina	2
Principal	4	Contra fagotto	16	Orchestral oboe	8
Trumpet	8	Cornopean	8	Orchestral clarinet	8
		Oboe	8		

Solo (7 stops)		Echo (5 stops)		Pedal (6 stops)	
Stentorphon	8	Flauto traverso	8	Open diapason	16
Voix celestes (II rks)	8	Echo dulciana	8	Bourdon	16
Concert flute	4	Vox angelica	8	Violoncello	8
Ophicleide	16	Dolce	4	Flute bass	8
Tuba mirabilis	8	Vox humana	8	Trombone	16
Cor anglais	8			Trumpet	8
Harmonica aetheria	II				

Couplers

Sw. to Gt.	Solo to Sw.
Sw. to Ch.	Solo to Gt.
Ch. to Gt.	Solo to Ped.
Sw. to Ped.	Echo to Ped.
Gt. to Ped.	Sw. oct.
Ch. to Ped.	Sw. suboct.

Accessories

Pistons: 2 Gt., 2 Sw.
Tremulant
Balanced Swell-pedals:
Sw. Ch.
Solo. Echo (in its own box inside Sw.)

Wind-pressures

Gt., Sw. & Ped.	$3\frac{1}{2}$"
Ch. & Echo	3"
Solo	8"

(Specifications -- Chapter Four -- continued)

22. WORCESTER CATHEDRAL -- Hope-Jones, 1896

Great(11 stops)

Diapason phonon	16
Tibia plena	8
Diapason phonon	8
Open diapason	8
Hohl flute	8
Viol d'amour	8
Octave diapason	4
Quintadena	4
Harmonic piccolo	2
Tuba profunda	16
Tuba	8

Swell(15 stops)

Violes celestes	8
Contra viola	16
Tibia clausa	8
Horn diapason	8
String gamba	8
Quintadena	8
Gambette	4
Harmonic flute	4
Harmonic piccolo	2
Dble.English horn	16
Cornopean	8
Oboe	8
Cor anglais	8
Vox humana	8
Clarion	4

Choir(10 stops)

Dble.open diapason	16
Open diapason	8
Cone lieblich gedact	8
Viole d'orchestre	8
Tiercina	8
Dulciana	8
Flute	4
Flautina	2
Cor anglais	8
Clarinet	8

Pedal(13 stops)

Gravissima	64
Dble.open diapason	32
Dble.open diapason	32
Tibia profunda	16
Open diapason	16
Violone	16
Bourdon	16
Octave violone	8
Flute	8
Diaphone } in 2 }	32
Diaphone } powers}	16
Tuba profunda	16
Tuba	8

Solo(6 stops)

Diaphonic horn	8
Rohr flute	4
Bombarde	16
Tuba mirabilis	8
Tuba sonora	8
Orchestral oboe	8

Couplers

Gt.suboct.(light wind)
Gt.super.(heavy wind)
Solo to Gt.sub.
Solo to Gt.(dble.touch)
Solo to Gt.super
Sw.to Gt.suboct.
Sw.to Gt.(dble.touch)
Sw.to Gt.super
Ch.to Gt.suboct.
Ch.to Gt.
Ch.to Ped.
Sw.suboct.
Sw.super.
Solo to Sw.(2nd touch)
Ch.to Sw.(2nd touch)
Solo to Ped.
Sw.to Ped.
Gt.to Ped.
Ch.suboct.
Ch.super.
Sw.to Ch.suboct.
Sw.to Ch.(dble.touch)
Sw.to Ch.super
Solo suboct.
Solo super.

Compound composition keys

5 Gt.,Ped.& couplers;
2 Gt.couplers;
5 Sw.,Ped.& couplers;
2 Sw.couplers;
2 for (i)Sw.heavy reeds
(ii)Sw.strings
(iii)both
3 Ch.,Ped.& couplers;
2 Ch.couplers;
3 Solo;
2 Solo couplers.

Pedals

4 Gt.& couplers
4 Sw.& couplers
Sforzando pedal
Balanced Sw.-pedal
Balanced Solo-pedal
Stop switch

(N.B. By means of the stop-switch, any combination can be prepared in advance.)

Gas blown. Detached stop-key console.

(Specifications -- Chapter Four -- continued)

23. M'EWAN HALL, EDINBURGH UNIVERSITY -- Hope-Jones, 1897

Great(12 stops)

Contra tibia clausa	16
Diapason phonon	8
Horn diapason	8
Tibia plena	8
Open diapason	8
Hohl flöte	8
Geigen principal	4
Quintadena	4
Harmonic flute	4
Harmonic piccolo	2
Bombarde	16
Trumpet	8

Swell(15 stops)

Violes celestes	8
Contra viola	16
Tibia clausa	8
Horn diapason	8
String gamba	8
Quintadena	8
Quintatön	4
Gambette	4
Harmonic flute	4
Harmonic piccolo	2
Dble.English horn	16
Cornopean	8
Oboe	8
Vox humana	8
Clarion	4

Choir(6 stops)

Viole d'orchestre	8
Lieblich gedackt	8
Dulciana	8
Flauto traverso	4
Corno di bassetto	8
Cor anglais	8

Solo(5 stops)

Rohr flöte	8
Tuba sonora	8
Tuba mirabilis	8
Kinura	8
Cor anglais	8

(enclosed, except tuba mirabilis)

Pedal(8 stops)

Quint (from Gt: lowest 8ve acoustic)	32
Open diapason	16
Double(from Gt.)	16
Dulciana	16
Flute(from Gt.)	8
Diaphone	32
Diaphone	16
Ophicleide	16

Couplers

Gt.suboct.(light wind)
Gt.super.(heavy wind)
Solo to Gt.suboct.
Solo to Gt.(dble.touch)
Solo to Gt.super
Sw.to Gt.suboct.
Sw.to Gt.(dble.touch)
Sw.to Gt.super.
Ch.to Gt.suboct.
Ch.to Gt.
Sw.suboct.
Sw.super.
Solo to Sw.(2nd touch)
Ch.to Sw.(2nd touch)
Ch.super.
Sw.to Ch.suboct.
Sw.to Ch.(dble.touch)
Sw.to Ch.super
Solo suboct.
Solo super.
Solo to Ped.
Solo to Ped.super.
Gt.to Ped.
Sw.to Ped.
Ch.to Ped.

Accessories

Composition keys:-
3 Gt.,Ped.& couplers; 2 Gt.couplers
4 Sw.,Ped.& couplers; 2 Sw.couplers
3 Ch.,Ped.& couplers; 2 Ch.couplers
3 Solo; 2 Solo couplers
5 adjustable (1 to each manual and to Ped.)
Sw.tremulant (light wind stops only)
Hope-Jones lever swell-pedal
Stop-switch (key & pedal)
Sforzando pedal (tuba mirabilis, ophicleide & Solo to Gt.)
5 ventil switches for various sections of the organ

(Specifications -- Chapter Four -- continued)

24. SOUTHWARK CATHEDRAL -- Lewis, 1897

Great(13 stops)

Contra viola	16
Bourdon	16
Open diapason, No. 1	8
Open diapason, No. 2	8
Stopped diapason	8
Harmonic flute	8
Harmonic flute	4
Octave	4
Octave quint	2 2/3
Superoctave	2
Cornet	III/V
Mixture	IV
Trumpet	8

Swell(14 stops)

Bourdon	16
Open diapason	8
Rohr flöte	8
Viola de gamba	8
Voix celestes(II rks)	8
Geigen principal	4
Rohr flöte	4
Flautina	2
Mixture	IV
Contra fagotto	16
Horn	8
Clarion	4
Vox humana	8
Oboe	8

Choir(10 stops)

Lieblich gedact	16
Geigen principal	8
Salicional	8
Dulciana	8
Lieblich gedact	8
Salicet	4
Lieblich gedact	4
Flauto traverso	4
Lieblich gedact	2
Mixture	III

Solo(10 stops)

Harmonic flute	8
Harmonic flute	4
Vox angelica	8
Unda maris	8
Cor anglais(ten.C)	16
Bombarde	16
Tuba magna	8
Trompette harmonique	8
Clarinet	8
Orchestral oboe	8

Pedal(12 stops)

Great bass	32
Major violone	32
Great bass	16
Violone(from Gt.)	16
Sub-bass(" Gt.)	16
'Cello	8
Flute(from Sub-bass)	8
Flute(from Sub-bass)	4
Contra posaune	32
Posaune	16
Bombarde	16
Trumpet	8

Couplers

Ch. to Ped.
Gt. to Ped.
Sw. to Ped.
Solo to Ped.
Ch. to Gt.
Sw. to Gt.
Solo to Gt.
Sw. to Solo
Sw. to Ch.
Solo oct.
Sw. suboct.
Sw. oct.

Accessories

Balanced pedal to Sw.
General crescendo pedal to entire organ
Key touches: 10 each manual (some affecting couplers only)
Composition pedals: 4 Sw., 4 Ped.
Lever pedal to Solo box

Wind-pressures: 3½" throughout, except Tuba & Trompette 12".

(Specifications -- Chapter Four -- continued)

25. MIDDLESBROUGH TOWN HALL -- Hill, 1898

Great(13 stops)

Dble.open diapason	16
Open diapason, No.1	8
Open diapason, No.2	8
Harmonic flute	8
Clarabella	8
Principal	4
Harmonic flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	IV
Contra posaune	16
Posaune	8
Clarion	4

Couplers

Ch.to Ped.
Gt.to Ped.
Sw.to Ped.
Solo to Ped.
Sw.to Gt.
Sw.oct.
Sw.to Ch.
Solo to Gt.
Solo to Sw.
Ch.oct.
Ch.suboct.
Sw.tremulant
Solo tremulant

Swell(15 stops)

Bourdon	16
Open diapason	8
Hohl flöte	8
Violoncello	8
Salicional	8
Voix celeste	8
Oboe flute	4
Principal	4
Fifteenth	2
Mixture	IV
Oboe	8
Cor anglais	8
Double trumpet	16
Trumpet	8
Clarion	4

Pedalboard concave & parallel

3 balanced swell-pedals

Wind-pressures:

4" throughout, except tuba 11".

Choir(7 stops)

Open diapason	8
Lieblich gedact	8
Dulciana	8
Vox angelica	8
Harmonic flute	4
Harmonic piccolo	2
Clarinet	8

Solo(8 stops)

Stopped flute	8
Viola	8
Flauto traverso	4
Orchestral oboe	8
Contra bassoon	16
Vox humana	8
Tuba	8
Chimes	17 notes

Pedal(9 stops)

Double diapason	32
Open diapason	16
Violone	16
Dulciana	16
Principal	8
Bass flute	8
'Cello	8
Ophicleide	16
Trumpet	8

(Specifications -- Chapter Four -- continued)

26. LINCOLN CATHEDRAL -- Willis, 1898.

Great(14 stops)

Dble.open diapason	16
Open diapason, No.1	8
Open diapason, No.2	8
Open diapason, No.3	8
Stopped diapason	8
Claribel flute	8
Flute harmonique	4
Principal	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Trombone	16
Tromba	8
Clarion	4

Swell(15 stops)

Dble.open diapason	16
Open diapason, No.1	8
Open diapason, No.2	8
Salicional	8
Vox angelica(ten.C)	8
Lieblich gedackt	8
Lieblich Flöte	4
Principal	4
Fifteenth	2
Mixture	III
Double trumpet	16
Trumpet	8
Clarion	4
Oboe	8
Vox humana	8

Choir(10 stops)

Lieblich bourdon	16
Viola da gamba	8
Dulciana	8
Hohl Flöte	8
Lieblich gedackt	8
Gemshorn	4
Concert flute	4
Piccolo harmonique	2
Cor anglais	16
Corno di bassetto	8

Solo(8 stops)

Gamba	8
Voix celestes	8
Claribel flute	8
Harmonic flute	4
Orchestral oboe	8
Orchestral clarinet	8
Tuba	8
Tuba clarion	4

Pedal(11 stops)

Dble.open diapason	32
Open diapason	16
Open diapason	16
Violone	16
Bourdon	16
Octave	8
Violoncello	8
Superoctave	4
Contra posaune	32
Ophicleide	16
Clarion	8

Couplers

#Sw.to Gt.
Solo to Gt.
Ch.to Gt.
Sw.oct.
Sw.suboct.
Sw.to Ch.
Solo suboct.
Sw.to Ped.
#Gt.to Ped.
Ch.to Ped.
Solo to Ped.
Sw.tremulant

(# reversible pistons)

#Ped.& accomp.to Solo pistons
#Ped.& accomp.to Ch.pistons
#Ped.to Sw.pistons
#Ped.to Gt.pistons
Sw.pistons to composition pedals
Gt.pistons to composition pedals

Accessories

Composition pedals: 8 to Ped.
Reversibles: Sw.to Gt.
Gt.to Ped.
Solo to Gt.
Solo tremulant
Pistons: 7 Gt., 7 Sw., 5 Ch., 5 Solo.
Reversibles: 6, to couplers marked #

Wind-pressures

Flues & light reeds	3½"
Gt.& Sw.chorus reeds	7"
Ped.reeds	15"
Tubas	20"

Blown by electric motors.
Pistons & composition pedals adjustable by 3-way switches at rear of console.
Tubular-pneumatic action (Willis 1889 patent supply system)

(Specifications -- Chapter Four -- continued)

27. ST. BEES PRIORY CHURCH -- Willis, 1899

Great(11 stops)

Dble.open diapason	16
Open diapason	8
≠Geigen	8
Stopped diapason	8
Hohl flöte	8
Wald flöte	4
Principal	4
Twelfth	2 2/3
Fifteenth	2
Tromba	8
Clarion	4

Swell(11 stops)

≠Lieblich bourdon	16
≠Lieblich gedackt	8
Open diapason	8
Gemshorn	4
Flageolet	2
Mixture	III
Vox humana	8
Contra posaune	16
Oboe	8
Cornopean	8
Clarion	4

Solo(9 stops)

Dble.salicional
Viole d'amour
Voix celestes
Claribel flute
Concert flute
Harmonic piccolo
Clarinet
≠Orchestral oboe
Tuba(unenclosed)

Pedal(7 stops)

Dble.open wood
Open wood(ext.)
Bourdon
Flute(ext.)
Octave wood(ext.)
Ophicleide
≠Tromba

(Stops marked ≠ are "prepared for" only, and have never been installed)

Couplers

Solo to Ped.
Gt.to Ped.
Sw.to Ped.
Sw.to Solo
Sw.oct.
Solo to Gt.
Solo suboct.to Gt.
Sw.to Gt.
Sw.tremulant

Ped.to Gt.pistons
Ped.to Sw.pistons
Ped.& accomp.to Solo pistons
Gt.pistons to composition pedals
Sw.pistons to composition pedals

Accessories

Pistons: 5 Gt., 5 Sw., 5 Solo, 3 ped.couplers.
Composition pedals: 6 Ped.
Reversibles: Solo to Gt.
Sw.to Gt.
Lever swell-pedals to Sw. & to Solo.

Pistons & composition pedals all adjustable by 3-way switches.

Wind-pressures

Ped.flues	3"
Other flues & light reeds	3½"
Gt.& Sw.chorus reeds & oboe, & Ped.reed	7"
Tuba	15"

(Specifications -- Chapter Four -- continued)

28. LEEDS PARISH CHURCH -- Abbott & Smith, 1899

Great(21 stops)

Sub bourdon	32
Dble.open diapason	16
Bourdon	16
Large open diapason	8
Small open diapason	8
Salicional	8
Pierced gamba	8
Hohl flöte	8
Gedackt	8
Octave	4
Principal	4
Harmonic flute	4
Nazard	2 2/3
Superoctave	2
Mixture	III
Full mixture	V
Double trumpet	16
Trumpet	8
Tromba	8
Clarion	4
Posaune	8

Couplers

Sw.to Gt.
Sw.Oct.
Sw.to Ch.
Solo suboct.
Solo to Gt.
Ch.to Gt.
Echo to Sw.
Solo to Ped.
Sw.to Ped.
Gt.to Ped.
Solo oct.
Ch.to Ped.
Sw.tremulant
Solo tremulant

Drawstop colours

Gt. & Sw.	white
Ch.& Echo	blue
Solo	green
Ped.& couplers	red

Swell(17 stops)

Double diapason	16
Open diapason	8
Stopped diapason	8
Viol d'orchestre	8
Voix celeste	8
Violin e 'cello	8
Wald flöte	4
Octave	4
Quint	2 2/3
Superoctave	2
Mixture	V
Contra fagotto	16
Horn	8
Trumpet	8
Oboe	8
Vox humana	8
Clarion	4

Pedal(11 stops)

Subbass	32
Open diapason I	16
Open diapason II	16
Violone	16
Bourdon	16
Flute bass	8
Violoncello	8
Full mixture	IV
Contra trombone	32
Trombone	16
Clarion	8

Accessories

Pistons: 5 Gt., 4 Sw.,
3 Ch., 4 Solo.
2 interchangeables
1 calcant
Composition pedals:
4 Gt.& Ped., 3 Sw.
Reversibles: Gt.to Ped.
Sw.to Ped.

Choir(9 stops)

Bourdon	16
Geigen principal	8
Dulciana	8
Lieblich gedackt	8
Vox angelica	8
Gemshorn	4
Gedact flute	4
Quintatön	4
Clarionet	8

Solo(7 stops)

String gamba	8
Doppel flöte	8
Concert flute	4
Double bassoon	16
Cor anglais	8
Orchestral oboe	8
Tuba	8

Echo(12 stops)

Lieblich bourdon	16
Open principal	8
Viol di gamba	8
Dolce	8
Flauto traverso	8
Echo oboe	8
Lieblich gedact	8
Lieblich flute	4
Octave	4
Flauto dolce	4
Flautina	2
Harmonica aetheria	II

Wind-pressures

Gt: 3½", Posaune 7"
Sw: 5"
Ch: 2½"
Solo: 5", tuba 8"
Echo: 1½"
Ped: 3½"

(Specifications -- Chapter Four -- continued)

29. ST. MARGARET'S CHURCH, WESTMINSTER -- Walker, 1897

Great (14 stops)

Dble. open diapason	16
Large open diapason	8
Medium open diapason	8
Small open diapason	8
Orchestral flute	8
Wald flöte	8
Principal	4
Harmonic flute	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Contra posaune	16
Posaune	8
Clarion	4

Swell (14 stops)

Lieblich bourdon	16
Open diapason	8
Lieblich gedackt	8
Echo gamba	8
Voix celestes	8
Principal	4
Flute	4
Fifteenth	2
Mixture	IV
Oboe	8
Vox humana	8
Double trumpet	16
Posaune	8
Clarion	4

Choir (10 stops)

Quintatön	16
Gamba	8
Dulciana	8
Vox angelica	8
Lieblich gedackt	8
Wald flöte	4
Viola	4
Piccolo	2
Clarinet	8
Orchestral oboe	8

Pedal (10 stops)

Dble. open diapason	32
Open diapason	16
Open diapason	16
Bourdon	16
Flute	8
Octave	8
Principal	8
Quint	10 2/3
Bombarde	16
Trumpet	8

Couplers

Ch. to Ped.
Sw. to Ped.
Gt. to Ped.
Ch. oct.
Ch. suboct.
Ch. unison-off
Ch. to Gt.
Sw. to Ch.
Sw. to Gt.
Sw. oct.
Sw. suboct.
Sw. unison-off
Ch. tremulant
Sw. tremulant
Gt. pistons to Ped. composition pedals

Accessories

Pistons:
- Gt. 6 (1 adjustable)
- Sw. 7 (1 adjustable)
- Ch. 4 (1 adjustable)
- Ch. to Gt. reversible
- Gt. to Ped. reversible

Composition pedals:
- Sw. 5
- Ch. 4
- Ped. 5
- Gt. to Ped. reversible

Wind-pressures

Gt: flues $4\frac{7}{8}$", reeds 5"
Sw: flues & light reeds $4\frac{3}{4}$"
chorus reeds 7"
Ch: throughout 4"
Ped: flues 4", reeds $12\frac{1}{2}$"

(Specifications — Chapter Four — continued)

30. NORWICH CATHEDRAL — Norman & Beard, 1899

Great(14 stops)

Dble.open diapason	16
Open diapason,No.1	8
Open diapason,No.2	8
Open diapason,No.3	8
Open diapason,No.4	8
Hohl flute	8
Stopped diapason	8
Principal	4
Flute harmonique	4
Twelfth	2 2/3
Fifteenth	2
Mixture	III
Double trumpet	16
Tromba	8
Clarion	4

Swell(15 stops)

Bourdon	16
Open diapason,No.1	8
Open diapason,No.2	8
Lieblich gedackt	8
Salicional	8
Voix celestes(II rks)	8
Principal	4
Lieblich flute	4
Fifteenth	2
Mixture	III
Contra fagotto	16
Horn	8
Oboe	8
Clarion	4
Cor anglais	8

Choir(9 stops)

Lieblich bourdon	16
Open diapason	8
Stopped diapason	8
Bell gamba	8
Dulciana	8
Wason flute	4
Harmonic gemshorn	4
Piccolo	2
Corno di bassetto	8

Solo(5 stops)

Flute harmonique	8
*Viola	4
*Flute harmonique	4
*Orchestral oboe	8
Tuba mirabilis	8

(* enclosed)

Echo(11 stops)

Subbass(12 pipes)	16
Contra viola	16
Gambe	8
Zauberflöte	8
Unda maris(ten.C)	8
Vox angelica	8
Viola	4
Harmonic piccolo	2
Harmonic trumpet	8
Cornet	VI
Vox humana	8
Gongs	

Couplers

Gt.to Ped.
Sw.to Ped.
Ch.to Ped.
Solo to Ped.
Echo to Ped.
Sw.to Gt.
Sw.to Ch.
Ch.to Gt.
Solo to Gt.
Sw.oct.
Echo oct.
Sw. tremulant .
Echo tremulant.

Pedal(10 stops)

Dble.open diapason	32
Open diapason	16
Open diapason	16
Dulciana	16
Bourdon	16
Violoncello	8
Bass flute	8
Trombone	16
Trumpet(ext.)	8
(Contra posaune - prepared for)	(32)

Accessories

Pistons: 5 Gt.,5 Sw., 3 Ch.,2 Solo, 5 Echo
Reversibles: Gt.to Ped., Sw.to Gt., Solo to Gt.
Composition pedals: 5 Ped. Sw.tremulant
Reversible: Gt.to Ped.

Wind-pressures

Gt: flues 4",reeds $6\frac{1}{2}$"
Sw: " "
Ch: throughout $3\frac{1}{2}$"
Solo: tuba 15", rest $6\frac{1}{2}$"
Echo: 4"-6"
Ped: flues 3"-6",reeds 15"

Lever pedals to Sw., Solo & Echo.

Tubular-pneumatic action, except Echo, which is electro-pneumatic.

(Specifications -- Chapter Four -- continued)

31. PROPOSED ORGAN FOR WESTMINSTER ABBEY -- Willis, 1879

Great(17 stops)

Open diapason	16
Dble.stopped diapason	
Open diapason	8
Open diapason	8
Open diapason	8
Open diapason	8
Principal	4
Principal	4
Flute harmonique	4
Twelfth	3
Fifteenth	2
Piccolo	2
Mixture	V
Trombone	16
Ophicleide	8
Trumpet(harmonic)	8
Clarion(harmonic)	4

Couplers

Sw.to Gt.suboct.
Sw.to Gt.
Sw.to Gt.super.
Ch.to Gt.
Solo to Gt.
Solo to Ped.
Sw.to Ped.
Gt.to Ped.
Ch.to Ped.
Tremulant.

Pedals as well as drawstops for:
Sw.to Gt.
Solo to Gt.
Gt.to Ped.

Swell(16 stops)

Lieblich bourdon	16
Lieblich gedackt	8
Lieblich flöte	4
Open diapason	8
Principal	4
Fifteenth	2
*Salicional	8
*Vox angelica	8
Open flute	8
Flute(harmonic)	4
Piccolo(")	2
Mixture	V
Contra hautboy	16
Hautboy	8
Cornopean	8
Clarion	4

(* 'Two soft but very reedy gambas; instant articulation')

Solo(7 stops)

Flute harmonique	8
Flute harmonique	4
Piccolo	2
Oboe(orchestral)	8
Clarinet	8
Vox humana	8
Tuba	8

Choir(14 stops)

≠Contra gamba	16
≠Viola-da-gamba	8
≠Echo gamba	8
≠Octave gamba	4
Open diapason	8
Principal	4
Fifteenth	2
Lieblich gedackt	8
Lieblich flöte	4
Claribel flute	8
Flute harmonique	4
Piccolo harmonique	2
Corno-di-bassetto	8
Trumpet	8

(≠ "Instant articulation")

Pedals(12 stops)

Dble.open diapason	32
Open diapason	16
Bourdon	16
Violone	16
Principal	8
Violoncello	8
Flute bass	8
Super octave	4
Mixture	III
Contra posaune	32
Ophicleide	16
Clarion	8

(continued overleaf)

(Specifications -- Chapter Four -- concluded)

(Proposal for Westminster Abbey -- continued)

"The pneumatic combination movement for the hands will exist in six changes upon each manual."

"Four pedals, also pneumatic, will be applied to the Pedale organ and placed where composition pedals are usually found and, by an auxiliary movement, these will be enabled to operate upon suitable changes in the Great organ".

- o - o - o - o - o - o -

Footnote.

The above specification was sent by Henry Willis to Canon Prothero in March 1879, following upon consultations which had been in progress since Willis was first called upon, in July 1878, to report on the Abbey organ. He quoted the sum of three thousand pounds as an approximate figure, to be regarded as a maximum, liable to be reduced according to the amount of existing material found to be usable.

The reader will observe Willis' remarks about the "instant articulation" of the string-toned stops, and his arrangement of the Swell and Choir stops in separate families, even dividing open flutes from closed.

Mr. Thompson-Allen, in publishing the correspondence that contained this specification, says:

1) "Many may well ask.....why did Father Willis not build his proposed organ........?........There was a reason, one deserving of highest praise to the first Henry Willis, why he ultimately refused to build the organ........The reason was in no way connected with any of the ecclesiastical authorities of the Abbey, nor did a question of cost affect the matter."

This reason, we are told, will have to be retained for the present as private family history: but it is tempting to wonder if there is any significance in Mr. Thompson-Allen's use of the word "ecclesiastical". What was the opinion of the "musical" authority of the Abbey on all this ?

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1. Org. 23. 163

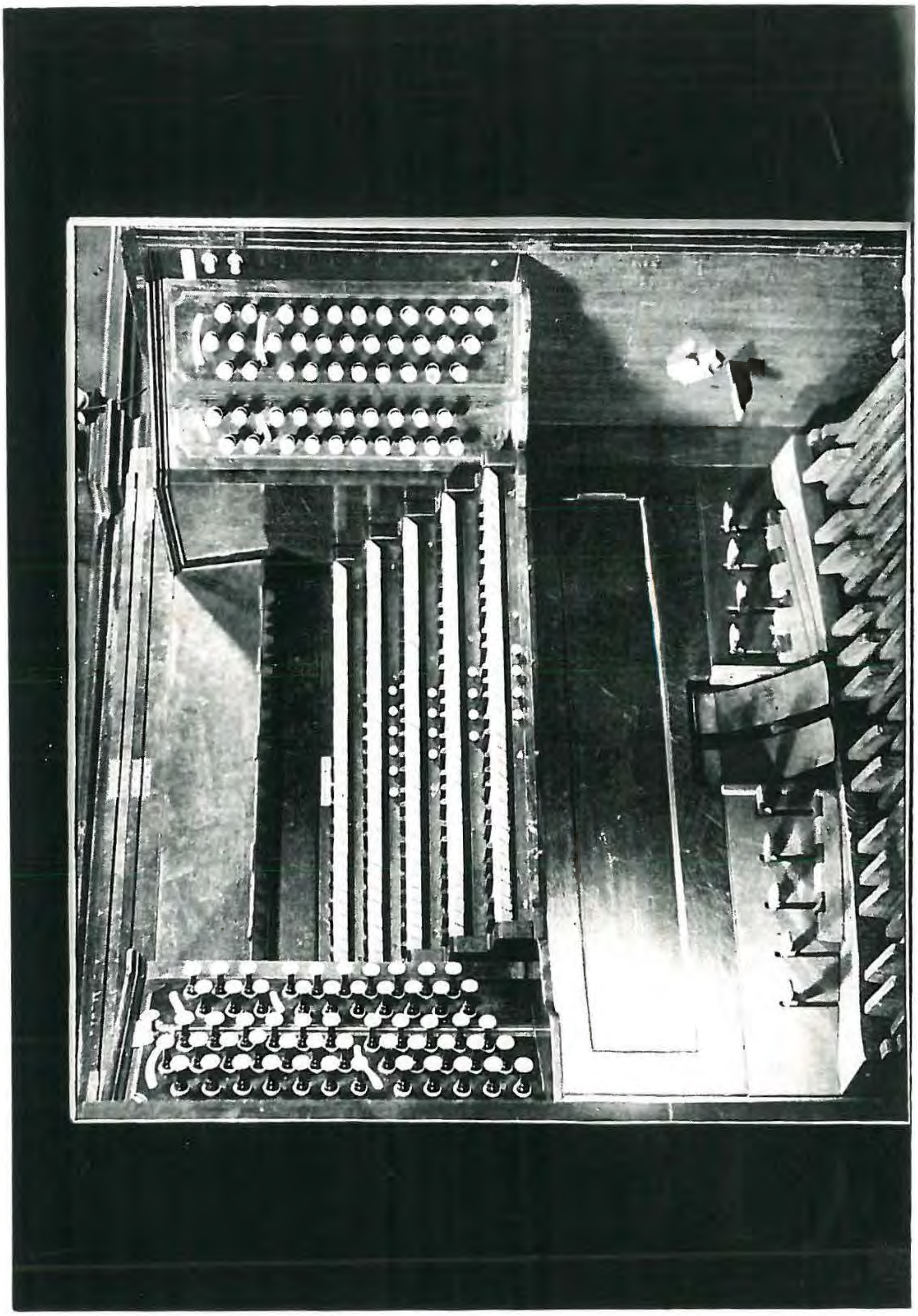

PLATE XIX.

A large late-century concert-organ console: Leeds Town Hall.

Gray and Davison's 1857 masterpiece was restored in 1898 by Abbott and Smith, with only minor alterations in the instrument's basic design. The Echo organ was given its own separate fifth manual (instead of being anchored to the Choir); much of the flue pipework was replaced — mainly because of a lowering of pitch to the newly-accepted French diapason normal — and new action and console were provided, with a consequent re-locating of the various departments internally. Incidentally, it is intriguing to learn that one of the improvements was the provision of "cleft pallets" for all soundboards; the layman might be surprised to hear that such things were thought desirable as a means of improving the organ's speech ! The presence of balanced swell-pedals is a praiseworthy feature for its time.

(Photograph from Org.6.81; block lent by Messrs. Abbott and Smith)

APPENDIX

OF

NOTES ON THE PRINCIPAL ORGAN-BUILDERS

In the following pages will be found short accounts of just over a hundred of the leading organ-builders of the nineteenth century. The majority of them have either been briefly mentioned in passing or else have not appeared at all in the preceding chapters. Some, on the other hand, have been discussed in great detail and referred to on numerous occasions; and what has been said previously will obviously not be repeated at any length now. The reader is referred to the Index of Names for a detailed list of the pages from which he may learn more of the work of such men. There were, of course, hundreds of others who practised the craft of organ-building, on a more modest scale and in their own immediate neighbourhood; and whose work was often fit to rank with the greatest. But a selection has perforce been made, bearing in mind the extent of each builder's reputation and the significance of his contribution to the history of his craft.

ABBEY, JOHN (1785-1859). He was an apprentice of Davis (q.v.) and of Hugh Russell (q.v.), and joined Erard in Paris in 1824, making his name and fame with an organ in the 1827 Louvre Exhibition. He soon became one of the foremost builders in France after the great Cavaillé himself, with a number of new and rebuilt Cathedral "grandes orgues" to his credit. He introduced into France the Venetian-shutter Swell and Cumming's inverted-rib bellows, and his English diapason-choruses were greatly admired in his adopted country. The only organ he built for England seems to have been one for the Royal Academy of Music.

ABBOTT AND SMITH (Leeds; established 1869). Though at first mainly occupied in the North of England, this firm -- still active to-day -- had secured a national reputation by the turn of the century, with organs as far distant as Ryde Town Hall (Isle of Wight), and many London instruments. Their principal works included Halifax Parish Church (1879 and 1897), Goldsmiths' College, London University (1892), and the large five-manual rebuilds at Doncaster Parish Church (1894), Leeds Town Hall (1898) and Leeds Parish Church (1899).

AINSCOUGH, HENRY (Preston; floruit c.1890). He built a number of modest instruments, mainly in Roman Catholic churches, in Lancashire, using only the finest materials and workmanship; consequently his work

(Ainscough)
lasted remarkably well. Perhaps his best-known organ was in the Catholic Cathedral at Lancaster (1889), with its beautiful flutes, splendid build-up and French-type three-manual console.

ALLEN, R. (Bristol; floruit 1866-71). He was active not only in his own part of the country, but also in London; for instance, the church
1) of St.Columba in Kingsland Road was described as being equipped with "a large and powerful instrument by Allen of Bristol, 1874".

ALLEN, WILLIAM (London; fl.1809-30). He built important organs in the Midlands, for example in the cathedrals of Peterborough (1809) and of Lincoln (1826), and the Parish Church of Stratford-on-Avon (1815), as well as one for Covent Garden Theatre (1810). His son CHARLES (fl. 1851-4) took over Elliott's former workshop near Soho Square, and rebuilt the Lincoln Cathedral organ in 1851.

ANNEESSENS, CHARLES (Grammont, Belgium; fl.1884-92). He was one of the several foreign builders who built organs of importance and of value in Britain, his most noteworthy being at Bridlington Priory (1889) and the Italian Church, Hatton Garden (1884).

AVERY, JOHN (London, d.1808). All writers from Hopkins onwards unite in describing him as an excellent workman, but a dissipated character.

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1. T.Francis Bumpus, "London Churches, Ancient and Modern" (1882)

(Avery)

In the opening years of the century he carried out work at King's and Trinity Colleges at Cambridge; St.Margaret's, Westminster; and Carlisle Cathedral, where he "died in harness". Avery has already been

1) mentioned for his share in the introduction of pedal pipes at Westminster Abbey late in the eighteenth century.

BANFIELD, JOHN (Birmingham; fl.1836-84). He built or rebuilt many organs in the Midlands in the middle years of the century; notable examples were at St.Mary's, Warwick (1838-42), St.Mary's, Stafford (1844-78-85) and St.Martin's, Birmingham (1875-84). The firm continued its activity into the present century.

BATES, THEODORE C. (London; fl.1839-64) Most of his work was in London's City Churches, e.g. St.Martin's, Ludgate Hill (1848) and St. Bride's, Fleet Street (1841); but he was not unknown in other parts of the country (St.Peter's, Bournemouth, 1860).

BEALE (afterwards BEALE AND THYNNE) London. After working on his own during the eighties, Beale formed a partnership with William Thynne on the dissolution of the latter's association with C.O.Michell (vide Michell and Thynne). Thynne's remarkable ability as a voicer contributed to a number of fine organs in London and the Home counties during the nineties; examples were at St.John's, Richmond and Holy Trinity, Upper Tooting.

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1. vide supra, p.21

BEDWELL (Cambridge; established 1890). This firm, which survived well into the present century, built several organs in Cambridge and East Anglia withing a very short time of its foundation, and before the end of the century the name of Bedwell had reached even as far afield as Wales, with a fair-sized three-manual instrument at Llandyssil in 1898.

BEVINGTON (London; established 1794). Henry Bevington, the founder of the firm, was a former journeyman with Robert Gray (q.v.), and he
1) took over Snetzler's workshop in Greek Street, Soho. He and his two sons, Henry and Martin, were among the most prolific of Victorian builders, with hundreds of instruments in all parts of the country — and indeed of the world. The majority of these were moderate-sized two- and three-manual organs with clear, bright-toned diapason choruses that have survived perfectly through subsequent rebuilds. Four-manual organs by Bevington were quite exceptional (Ealing Town Hall, 1862, was one of the very few); and among their infrequent larger three-manuals of more than forty stops may be mentioned the Mechanics' Hall, Nottingham (1849), its twin sister at the Colosseum, Regent's Park a year later, St. Martin's-in-the-Fields (1854) and the Foundling Hosp-

1. This Soho workshop was undoubtedly the one referred to by Dickens in "Tale of Two Cities", though at the time of which he wrote — 1780-1 — Bevington had not yet moved in, while Snetzler had given up his business about 1780. The identity of Bevington's immediate predecessor is obscure: most probably it was Ohrmann and Nutt (q.v.)

ital (1855). None of these was larger than 48 speaking-stops, and it is perhaps the modest size of their instruments which is responsible for the meagre recognition which the work of the Bevingtons has hitherto received. There was nothing sensational in what they produced, but their organs had a beautiful "thoroughbred" quality of tone and finish which is none too common these days.

Environment and tradition mean a great deal; and the influence of Snetzler may well have lingered in his old workshop and inspired the hearts and hands of those who laboured there. (For the sake of historical exctitude, it must be pointed out that the Bevingtons moved to another address in 1840; but the Snetzler seed had plenty of time to germinate in the forty years in which Bevington organs were being built at Number Twelve.)

BEWSHER AND FLEETWOOD (Liverpool; established 1821). This firm, whose senior partner's name sometimes appears as Bewschur, Bewshur or Bücher, was active until about the middle of the century, when it was absorbed by Grey and Davison (q.v.). There are indications that the partners were in business separately before the year 1821. Their work lay not only in Liverpool itself, always an active field for organ-builders, but further afield in the Midlands, Wales and Ireland. The organs in Pembroke Chapel and the Collegiate Institution, Liverpool (afterwards transferred to the Philharmonic Hall) were outstanding examples of their art.

<u>BINNS, JAMES JEPSON</u> (1855-1929). The well-known Leeds firm, which is still flourishing to-day, was established in 1880. Though its present reputation rests mainly on work done during this century, the early work of Binns was so excellent that, before the firm was twenty years old, he had supplied organs for Belgium, Jerusalem and South Africa as well as throughout the length and breadth of Great Britain. His tonal schemes, especially on the Pedal, were remarkably progressive for his time, his flue-stops well-voiced and his workmanship first-class. He was a great admirer and follower of Schulze (not surprisingly for one who had the care of the Armley organ over a long period) and modelled his diapasons exactly on Schulze's pattern. His magnum opus (Great Yarmouth Parish Church: 4 manuals, 66 stops) was built in 1902.

<u>BISHOP, J.C.</u> (London). This firm was founded at the end of the eighteenth century and survived under various titles, including temporary partnership with Starr and Richardson, until the twentieth. Bishop's inventions have already been mentioned -- composition pedals, concussion bellows, the Clarabella stop -- and his suppression of the Cornet. The most active period of the firm began in about 1820, culminating in their chef d'oeuvre at Southwell Cathedral (1890: 4 manuals, 54 stops). Other important organs were at St.Giles', Camberwell (1844), Brompton Oratory (1858), St.Mary's, Nottingham (1871) and Great Yarmouth Parish Church (1875). Some of the greatest Cathedral and Collegiate churches appear in their list of contracts -- St.Paul's, Durham, Southwark, Here-

ford, Coventry, the Temple, Magdalen, New College, Christ Church; and Newark, Warwick and Leeds parish churches. Even as far away as Bombay there were Bishop organs: in the Cathedral (1863) and in the Town Hall (1872).

BLYTH, BENJAMIN (Isleworth, London; d.1840). He was originally Samuel Green's foreman, and after Green's death in 1796 Blyth carried on the business in partnership with Green's widow, under the style of Blyth and Green; later he was joined by his son James (d.1847). He was entrusted with the rebuilding or maintaining of several important organs, including York Minster (1803), and Winchester Cathedral (1825-36-46); Magdalen and New Colleges, Oxford, Winchester College and the parish churches of Leeds and Northampton. The firm's activities came to an end with James Blyth's death.

BOOTH, JOSEPH AND FRANCIS (Wakefield; fl.1827-64). Joseph's invention of pneumatic "puffs" at Attercliffe has been described. Prominent instruments built or rebuilt by him and Francis -- presumably his son, whose name begins to appear in the forties -- were in Brunswick Chapel, Leeds (1828 and 1846), Selby Abbey (date unknown), and Wakefield Cathedral (1837 and 1864).

BRINDLEY AND FOSTER (Sheffield; established 1854). This firm was founded by Charles Brindley, and has survived into modern times under the name of Brindley and Company. The firm's reputation soon spread throughout the country, and their output was large during the second half of the century. Their organs, though of modest size on the whole, included some useful mechanical improvements; and among their major instruments may be mentioned those in Christ Church, Sutton, Surrey (a 42-stop 4-manual) in 1888, St. Mark's, Sheffield (1878), Sheffield Cathedral (1883), Boston Parish Church (1871) and Wesley's Chapel, City Road (1891). There is also a well-preserved example of their craft dating from 1874 in the Presbyterian Church in Grahamstown, South Africa, where this work is being written.

BROWNE, F.H. (Canterbury). This firm, which is still in existence, was founded in the seventies. Its work has been mainly concerned with small organs, but its output has been large and effective. Most of these instruments were supplied to churches in Kent and its immediate neighbourhood, but there were occasional excursions as far as, for instance, St. George's, Wolverhampton (a 30-stop 3-manual in 1897) and to All Saints', Exmouth in 1898.

BRYCESON (London). This name first appears as that of a London organ-builder in 1803, according to the Postal Directory; but it is by their work in the final four decades of the century that the firm of Bryceson Brothers, for a brief few years linked with the names of Ellis and of Morton, is remembered and respected. Their pioneer work in electric action has been fully described: their masterpiece was the 68-stop 4-manual for the Holmes residence in Regent's Park.

BUCKINGHAM (London; fl.1819-36). His reputation was sufficiently high for him to be entrusted with contracts for repairs and additions to such organs as those in Southwell Cathedral (1819), King's College, Cambridge and Doncaster Parish Church (both 1822) and Durham Cathedral (c.1836).

BUCKNELL, E. AND H. (Hackney, London). This firm was active between 1834 and 1875, building organs in London as well as in Cambridge and the western counties.

BUNTING, JOHN (London). He was responsible for the repair and enlargement of a number of London's City church organs between 1828 and 1878.

BUTLER, JAMES (London; 1780-1863). He and Joseph Walker were apprenticed to George Pike England (q.v.) and to A.N.Nicholls (q.v.), who was England's foreman and son-in-law. Butler took over England's business from his widow, who had retained its management with the help of Nicholls until the latter's death in 1825. Butler used always to claim that he was England's successor; his work lay mainly among the churches of the City of London.

CASSON, THOMAS (London; 1842-1910). He founded the "Positive Organ Company" in 1887. A banker by profession, he formed emphatic views on organ-design, tonal and mechanical. His proposals for the Pedal department have been described. On the manuals, he propounded the system of "octave duplication" (often referred to as "borrowing", to Casson's intense indignation), which was in fact not unlike the technique we now know as "extension"; he devised thes "pedal help", which automatically provided a suitable combination of pedal stops to conform with every change of the manual stops; he produced a "melody" device whereby the top note of any chord could be given prominence on a solo stop affecting that note only; and a "double-bass" effect, which sounded the lowest note played by the fingers as a pseudo-pedal note at 16ft pitch (with extra pipes below the manual range to complete the effect).

These "melody" and "double-bass" devdces were features of the Positive organs built by Casson' company with tremendous success and popularity; but the larger Casson organs were not widely accepted. Octave duplication and pedal helps have their universal modern counterparts, but in Casson's day organists were not ready for such things. However, his ideas on tonal design were not wasted. As a recent writer

1) has said, "It must have required great determination to put out such advanced schemes and to build organs with such complete flue-work tonal structures at a time when the reaction against chorus-work, led by Hope-Jones and his followers, was at its height.....Casson's

1. George Dixon, Org.28.57

"ideals have undoubtedly inspired others during this century to insist that, before all things, a bold initial tonal structure is a 'sine qua non' in sound organ design, even in small instruments......."

As examples of his work may be mentioned here: the organ built for Dr. Yorke Trotter's London Organ School (3 manuals, 24 stops), in which the 8-stop Great included a 32ft (from middle C), two at 16ft and a five-rank mixture; and his largest organ, in the Church of the Sacred Heart, Omagh, Ireland (3 manuals, 51 stops), where the twelve-stop Great was complete from <u>three</u> doubles up to five-rank mixture.

<u>CAVAILLE-COLL, ARISTIDE</u> (1811-1899; Paris). This eminent French builder supplied several outstanding instruments in various parts of Britain. His largest was in the Albert Hall, Sheffield (1873), and others included the Manchester Town Hall (1877) and Mr. Hopwood's chamber organ at Ketton Hall, later moved to Bracewell. Most of the country's leading recitalists played on these organs at one time or another, and so Cavaillé-Coll's influence was by no means negligible; much more about his work will be found in earlier pages.

<u>CONACHER, PETER</u> (Huddersfield; established 1854). This was another firm that sprang into prominence quite soon after its foundation; by the end of the century there were some hundreds of Conacher organs

throughout Britain and overseas. During the nineties, for instance, they appeared in Canada, India, Italy, Portugal, South Africa and the West Indies. Among the firm's principal instruments were those in Londonderry Cathedral (1887; 4 manuals, 45 stops), St.Stephen's, Dublin (1889; 4 manuals, 35 stops), Derby-road Baptist Church, Nottingham (1894; 4 manuals,40 stops) and Mr.Harris' celebrated residence organ at Calne (1898; 5 manuals, 40 stops).

CORPS, J.M. AND C. (London and Reading; fl.1845-70). This firm's main claim to fame lies in their 1851 Exhibition organ, described in Chapter Three. Very few traces remain of their work, but their reputation was more than a purely local one, as is shown by the fact that they were connected with such instruments as those in Winchester College Chapel and Andover Parish Church.

DAVIS, JAMES (London; fl.1802-20). He built or repaired some important London instruments, including Christ's Hospital, Southwark Cathedral and Greenwich Hospital. His factory was a famous meeting-place for organists, and he was himself a skilful player. Samuel Wesley writes thus in a letter to his friend Bridgtower: 1)

"Dear Sir, I have appointed a few friends to meet me to-morrow morning at 11 o'clock in Francis Street, Tottenham Court Road (very near Clementi's manufactory) at Davis's, the organ-builder, whose

1. James T. Lightwood, "Samuel Wesley, Musician", p.137

"name is on the door, and who has built an excellent instrument for a church at Surinam in the West Indies".......(This letter was dated September 4th, 1812).

In later years, Davis moved to Manchester and founded the firm which is now carried on under the name of Jardine and Company.

DICKER (Exeter; fl.1848-70). This was a leading West-Country firm, whose reputation may be judged from the fact that they were the builders of the organs in such large and important new parish-churches as St.Mary's, Upton, Torquay (1850) and Holy Trinity, Exmouth (1870).

1) EAGLES (London). He is described by a recent writer as "a London organ-builder who had a factory at Hackney and did considerable work about the middle of the nineteenth century in churches in the East end of London, and in Essex."

ELLIOTT, THOMAS (London; d.1832). He was part of the succession connecting Snetzler with William Hill. Snetzler's business was taken over in 1780 by his foreman Ohrmann, a Swede, who was joined in 1790 by W. Nutt; in 1803, Ohrmann died and Elliott joined Nutt. Two years later, Elliott was in business on his own, and so remained until 1825, when he formed a partnership with his son-in-law William Hill which lasted until his own death in 1832. Elliott was undoubtedly one of the out-

1. W.L.Sumner, "The Organ", p.220

standing builders of the early nineteenth century, and the many organs which were wholly or partly his handiwork included Hereford Cathedral (1810), Carlisle Cathedral (1808), Canterbury Cathedral (1810), King's College, Cambridge in the same year, the Chapels Royal at Whitehall (1814) and St.James' (1819), and Malvern Priory (1818).

After Hill became his partner, the firm made additions to Westminster Abbey (1826), and built new organs at Ely Cathedral (1831) and York Minster (1832-3) -- the famous "Second York" instrument. During its construction, Elliott died, leaving William Hill to continue developing a business which had no rival in the second quarter of the century, and which thereafter shared the supremacy only with Henry Willis.

ENGLAND, GEORGE PIKE (d.1815). He was the son of George England -- Richard Bridge's son-in-law -- who flourished as an organ-builder between 1740 and 1788. The younger England then entered upon a most active period of work which lasted until his death in about the year 1815. Over forty instruments have been traced as attributable to him either as builder or restorer, thirty of them dating from 1801 or after. The most important of these have already been described or referred to in Chapter One, the biggest being Newark Parish Church (1804) with 3 manuals and 25 stops -- an exceptionally large instrument for that time.

FLIGHT AND ROBSON. Benjamin Flight was the son of an elder Benjamin Flight of the late eighteenth-century firm of Flight and Kelly; the younger Flight began his own business in about 1800 in conjunction with Joseph Robson. This partnership, which lasted until it was dissolved by lawsuit in 1832, was responsible for a good deal of reconstruction and maintenance work, but the only outstanding instrument produced entirely by them was the unique Apollonicon, described in Chapter Two.

After the dissolution of the partnership, Robson continued under his own name (q.v.); his firm was eventually bought up by Gray and Davison. Flight also carried on, together with his son, under the title of "Flight and Son", and his firm remained active long after Benjamin's death in 1847. One of its finest instruments was the 54-stop 4-manual at St.Michael's College, Tenbury in 1856. Flight was the inventor of several mechanical improvements, one of which was a forerunner of the concussion bellows for steadying the wind-supply: it was very possibly Flight's device that suggested the idea to Bishop, who finally perfected it.

FORSTER AND ANDREWS (Hull; established 1843). Both men were pupils of Robson, and the business which they founded in Hull is still in existence, though transferred in quite recent times to London. Their reputation swiftly spread beyond the neighbourhood of Hull; within twenty-two years of their establishment they were supplying a 49-stop 4-manual for the Kinnaird Hall, Dundee; and in their 35th year they were chosen by Dr. Hopkins for the considerable enlargement and reconstruction (up to 60 stops) of the Temple Church organ. Many of their organs were sent overseas, and by the end of the century were to be found in Australia, Holland, Penang, Portugal and South Africa, among other places.

GERN, AUGUST (London). As Cavaillé-Coll's foreman, Gern was in charge of the erection of the latter's new organ in the Carmelite Church, Kensington, in about 1865; and shortly afterwards he settled in England and opened his own factory at Chiswick. Here he produced a number of organs of small and medium sizes, up to a 40-stop maximum, for many widely-separated parts of Britain, stretching from Dover to Peebles. The firm continued in business until the early years of the present century.

GINNS (Merton). He built a fair number of important instruments in London and the South during the final decade of the century, including those in Christchurch Priory and Stretford Town Hall.

GRAY; ROBERT, WILLIAM AND JOHN (London). These three generations of organ-builders were among the leaders of their craft in the latter part of the eighteenth and earlier part of the nineteenth centuries. Robert established his factory in 1774 and was succeeded by William at a date that is not known, but was probably in the late nineties, as it was definitely William who provided St.Martin's-in-the-Fields with a new organ in 1799. He died in 1820, and was in turn succeeded by John, who entered into partnership with his son-in-law Frederick Davison in 1838. For the subsequent history of this firm, see under "Gray and Davison" below.

William Gray's principal organs in the first few years of the nineteenth century included Wakefield Cathedral (1804), Auckland Castle, Durham (1811) and Dublin Cathedral (1815). John further enhanced the firm's reputation with such instruments as St.Luke's, Chelsea (1823), St.Sepulchre's, Holborn (1827 and 1835), Trinity College, Cambridge (1836) and Exeter Cathedral (1838).

GRAY AND DAVISON (London; established 1838). From the date of its inception, this partnership proved to be one of the most prolific producers of fine organs throughout the remainder of the century, and indeed it is still in existence to-day -- though it no longer occupies that position in the craft which it had earned prior to about 1890. Several of Gray and Davison's greatest instruments have been described in earlier pages -- Magdalen, Oxford (1855), Crystal Palace (1857), Leeds Town Hall (1858), Bolton Town Hall (1874), and St.George's Chapel, Windsor (1882). These and hundreds of others, all distinguished by their beautiful flue-work, combined to create a reputation that was surpassed only by Willis and Hill, and equalled only by Walker.

GREENWOOD, J. AND W. (Leeds; fl.1810-41). These brothers carried out some important contracts in Yorkshire; among other organs, they enlarged those in the parish churches of Halifax (1810), Barnsley (1820-4) and Leeds (1815 and 1841).

HALL, NELSON (Upton Scudamore, Wiltshire; fl.1856-67). He was the builder who carried out the designs of the Rev. Dr. John Baron, rector of the parish, for what came to be known as the "Scudamore organ". This was little more than a very small one-manual of one, two or three stops, with or without an octave or two of pull-downs; the merits of this type of organ being its cheapness, economy of space, and immense superiority to any of the harmoniums or "American organs" which were then beginning to flood the smaller and poorer churches. Dr. Baron wrote a book entitled "Scudamore organs; or Practical Hints respecting Organs for Village Churches and Small Chancels on Improved Principles," and Nelson Hall built a number of specimens in the district. Then, in 1858, Henry Willis began building instruments on the lines suggested in Baron's book, and produced several hundreds of them at prices from £40 upwards.

<u>HALMSHAW</u> (Birmingham). This firm was in business in the Midlands during the second half of the nineteenth century, surviving into the twentieth. Among their important organs were those in St.Paul's United Methodist Church, Dudley Port in 1853 -- this was a rebuild of the Green/Elliott organ removed from Malvern Priory -- and the Church of the Messiah in Birmingham in 1861.

<u>HAMILTON, D. AND F.</u> (Edinburgh). David Hamilton's share in the invention of the pneumatic-lever has been described in Chapter Two; he was also organist of St.John's Episcopal Church, and in 1851 published "Remarks on Organ Building and the Causes of Defective Instruments". The last member of the firm, David's nephew Frederick, died in 1940 and the business was taken over by Messrs. Ingram. Among their best instruments were those in St.John's, Edinburgh (1836) and in Park Church, Glasgow (1866; transferred 21 years later to the Greyfriars West Church, Edinburgh, and then rebuilt.)

<u>HANCOCK, JAMES</u> (London; d.1820). He was the last survivor of the firm of Crang and Hancock which had built organs in many parts of England in the seventeen-seventies and afterwards. Little is known of James Hancock's work; but his reputation was high enough for him to be entrusted with a considerable enlargement of the organ in St.Sepulchre's, Holborn in 1817.

<u>HARRISON AND HARRISON</u> (Rochdale and Durham). Thomas Harrison, a former Willis apprentice, founded his business in Rochdale in the early sixties, and among his first products were the organs in St. Giles', Oxford (1867) and St. Andrew's, Penrith (1870). Soon after this date, Harrison moved to Durham, where two of his earliest instruments were the remarkable four-manual in St. Martin's, Scarborough (1877) and the even bigger one in St. Giles' Cathedral, Edinburgh (1878 and 1887).

The firm became rapidly involved in a large amount of business, mainly in the Northern half of England (with some in the Colonies); Thomas Harrison's son Arthur (1868-1936) joined the firm in due course, and soon after the beginning of the new century the firm was climbing swiftly towards its present eminence in the sphere of organ-building.

<u>HEDGELAND, WILLIAM</u> (London; established 1851). He built organs in several prominent London churches and elsewhere, including St. Mary's, Paddington (1858), Holy Cross Church, St. Helen's, Lancashire (1865) and Tottenham Parish Church (1880).

<u>HELE</u> (Plymouth; established 1872). The founder of this still-thriving firm, George Hele, was an organist as well as a builder until his death (a tradition that was maintained by his son and successor, J.C. Hele, B.Mus. Oxon., F.R.C.O.) The name of Hele came early into prominence with the 43-stop 4-manual in Upton Parish Church, Torquay (1880), and the slightly smaller 4-manual in St. John's, Waterloo Road (1882). The

firm soon built up a well-deserved reputation in London and the West, with occasional excursions elsewhere in the United Kingdom as well as overseas. Their organ in Marylebone Presbyterian Church (1896) had many outstanding tonal and mechanical features in its 3-manuals and 42 stops.

HILL, WILLIAM (1789-1870). The origins of Hill's firm are given under the name of his father-in-law, Elliott (q.v.); and so much has been said about his work in earlier chapters that little remains to be added here. Suffice it to mention that, from the time that Elliott's death in 1832 left Hill in sole charge of the business, he had only Willis as a rival for the leadership of his profession. His short-lived partnership with Davison (1837-8) produced the Coronation organ in Westminster Abbey -- afterwards transferred to St.John's, Chester -- before Davison left to marry John Gray's daughter, thus providing yet another example of the oft-adopted procedure of How to Succeed as an Organ-Builder, or "Love among the Wind-Chests".

William Hill was followed by his son Thomas, in whose hands the firm went from strength to strength; and in 1893, Thomas' son Dr.A.G.Hill took over the reins, a man to whose technical knowledge and skill was added his splendid artistic gifts. His studies of Medieval and Renaissance organ-cases were published in two monumental volumes, and showed their influence in the many beautifully-designed cases in which Hill organs were clothed.

The firm lives on to-day, amalgamated since 1916 with Messrs. Norman and Beard, and able to look back on two centuries' unbroken traditions since Snetzler set up his London workshop in 1755.

HOLDICH, GEORGE MAYDWELL (London). He established a factory near King's Cross in 1838 and was in business until about 1895, when Gray and Davison acquired his firm's interests. In 1840 he moved into Bevington's old house at 12, Greek Street, Soho, but it is not known whether he used this address as his workshop or only as his residence. He built or rebuilt many organs throughout Britain, and his work was noted for its pleasing, mellow tone, which was sometimes, however, rather lacking in "body" owing to Holdich's stringent economy of wind-supply and wind-chest space, together with his use of light wind-pressures.

He was an early advocate of a fully-adequate Pedal department, as was well-illustrated in his masterpiece at Lichfield Cathedral (1860). Other important instruments associated with Holdich's name were those in Peterborough Cathedral (1848), St. Margaret's, King's Lynn (1852), St. Margaret's, Westminster (1859), St. Martin's, Leicester -- now the Cathedral -- (1840), St. Alban's, Holborn (1862) and Bow Church, Cheapside (1867).

HOLLAND, JOHN (Bath; fl. 1803-22). He was very probably son of the H. Holland who was a Bath organ-builder towards the close of the eightsenth century. John Holland had a splendid opportunity, which he did not fail to grasp eagerly, when his estimate for the reconstruction of the Bath Abbey organ was accepted in 1803. He was also concerned, among other organs, with those in Southwell Cathedral (1812-1819) and Sherborne Abbey, which would seem to indicate that his fame was more than merely local.

HOLT, WILLIAM (Leeds; fl.1850-77). He was responsible for a fair number of new or restored organs in Yorkshire and Lancashire, including those in St.George's Hall, Bradford (1853), Leeds Parish Church (1859), and Square Congregational Church, Halifax (1857).

HOPE-JONES, ROBERT (1859-1914). He was a telephone-engineer by profession, and honorary organist and choirmaster of St.John's, Birkenhead, where he carried out his first experiments with electric-actions and detached consoles. Enough has already been said in Chapter Four in description of his principal instruments and in appraisal of his contribution to organ-building, to warrant no further comment here. He left for America in 1903, having licensed a number of English builders to use his inventions. After a difficult period financially, he sold his patents and plant in 1910 to the Wurlitzer Company, with consequences that are well-known to modern devotees of the organ. He died by his own hand in 1914.

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1. 1859 was the year in which Sculze and Hill made considerable additions to the Leeds organ; Holt carried out some preliminary repairs and prepared the soundboards for Schulze's new pipework.

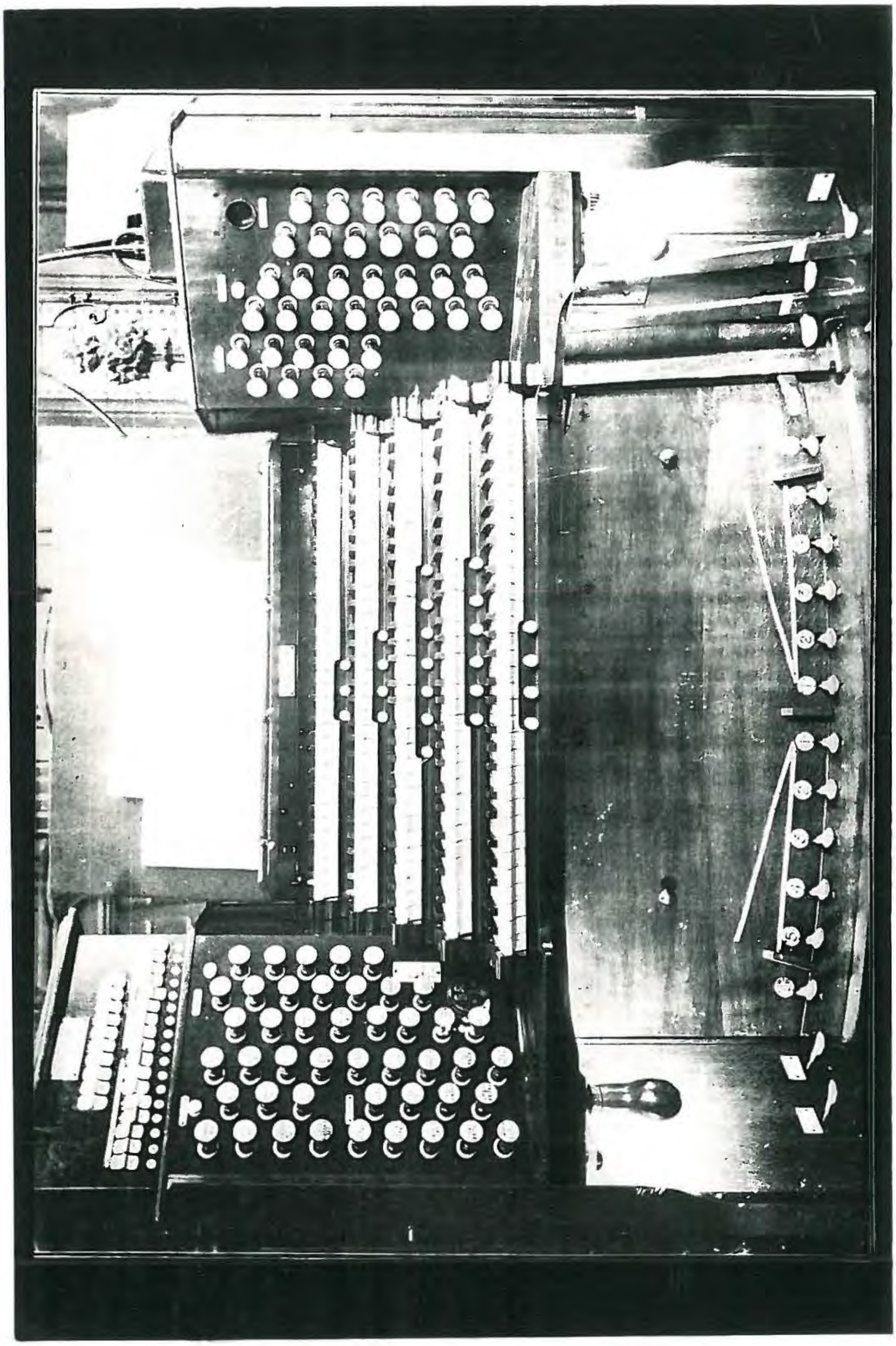

PLATE XL.

Westminster Abbey: the console.

This photograph is, in fact, a view of the 1909 console; but it is included here for two reasons. The stop-keys controlling the Celestial Organ can be seen over the left-hand stop-jamb, exactly as they had been since their installation in 1895; and it may further be observed that, even in an organ of national importance rebuilt by a firm which had been outstanding in its support of the balanced swell-pedal, the clumsy old-fashioned hitch-down pedals prevailed some years into the twentieth century.

(Photograph from Org.2.145, by Gilbert Benham)

HUNTER, A.I. (Catford). He began to become known as a builder of organs of solid worth and fine workmanship from about 1860 onwards, first under the name of Hunter and Webb, and later as Hunter and Son; and his firm remained in active existence well into the twentieth century, until its recent amalgamation with Henry Willis. Before the end of the nineteenth century, there were Hunter organs all over Britain and in Australia, France and Ceylon. They were not of spectacular size, and it is possibly on this account that Hunter's name is not as widely remembered as his work deserves. His more important contracts included St.Thomas', Portsmouth (1883),-- now the Cathedral -- St.John, Putney (1889) and Christ Church, Beckenham (1897).

INGRAM, EUSTACE. Connected at various times with London, Hereford and Edinburgh, this firm was worked steadily and successfully, without any sensational developments, from about 1870 until to-day. Ingram's organs, in London and in many parts of England and Scotland, were mainly modest in size until after the turn of the century; indeed, two of his biggest nineteenth-century instruments were at St. Mary's, Ross-on-Wye (1884) and St.Mark's, Walworth (1885) -- both of them three-manuals, with 34 and 31 stops respectively.

IVIMEY, JAMES (Southampton; established 1866). This firm was of considerable local importance towards the end of the nineteenth century, and was still in existence in recent years, when a partnership was formed with Cooper, formerly head of the South African firm of Cooper, Gill and Tomkins.

JACKSON (Liverpool). About the middle of the nineteenth century, this builder was producing instruments which were well above the average for their time and were designed with very progressive tonal schemes. Among these were the organs in the Collegiate Institution, Liverpool (3 manuals, 40 stops) and in Preston Parish Church (3 manuals, 36 stops), both of them built in 1850.

JARDINE (Manchester). Mention has already been made of James Davis (q.v.), who went north from London and settled in Manchester to found the business which, after passing through the successive stages of Wren and Boston (q.v.), Kirtland and Jardine, and Jardine and Smith, settled down into its present nomenclature of Jardine and Company.

The "Kirtland and Jardine" period seems to have seen the best days of the firm, i.e. about 1850 to 1865. Instruments were then built which were outstanding for their size and progressiveness of design in comparison with the average standards of their time! three Manchester organs may be quoted. Holy Trinity (1852) was a 4-manual of 49 stops; St.Peter's (1856), also of 4 manuals, had 61 stops; and the Free Trade Hall had 3 manuals and 52 stops. In the later decades of the century, Jardine's firm obviously maintained an excellent name in the North, and their output was large; but, somehow or other, the brilliant promise of the fifties was not developed any further, as far as the production of outstanding or unusual work went.

JONES, HENRY (London; established 1845). From their foundation until the early part of the twentieth century, this firm were responsible for a large amount of good, solid and conscientious work, which has always proved worthy material for reconstruction when its time came — in London for the most part, but with sufficient examples throughout the country for Henry Jones and Son to be regarded as builders of national importance. Their organs were of medium and small sizes; for instance, one of their largest was the 37-stop 3-manual rebuild in St.Luke's, Chelsea (1895). Moseley Parish Church, Birmingham (1887), and High Wycombe Parish Church (1867) were a few stops smaller; the Moseley organ, incidentally, had first been exhibited by the firm in the 1885 Inventions Exhibition.

KIRKLAND, ALFRED (Wakefield; established 1874). After making a successful start in Wakefield, including the reconstruction of the Cathedral organ in 1879 (3 manuals, 36 stops), he opened a factory in North London, retaining branches in Wakefield and Burton-on-Trent. Among his important late-century organs in the South was that in St.Clement Danes Church, Strand (1893; 3 manuals, 36 stops).

LEWIS, THOMAS C. (London). Much has already been said in earlier chapters about this organ-builder and bell-founder whose tonal ideals were so pronounced in their emphasis on the fully-developed, bold diapason-chorus on the Schulze pattern, in which the reeds had little or no importance. Most of his principal instruments have been described or referred to; he was certainly one of the leaders of his craft in the second half of the nineteenth century, both in the influence he exerted and in the number and importance of the contracts he fulfilled.

After his retirement about the turn of the century, his successors in the business (which retained his name) adopted rather different methods of design, with but little credit attending their efforts; and after the first World War the firm of Lewis and Company was amalgamated with that of Henry Willis.

LINCOLN, HENRY CEPHAS (1789-1864). A builder of some repute in the first half of the nineteenth century, he succeeded his father, John Lincoln, who was connected with such instruments as the Chapel Royal, St. James' (1802), and Trinity College, Cambridge (1808). From about 1812 onwards, we find H.C. Lincoln in charge of the business; his early organs included those of St. Margaret's, King's Lynn (1816) with 3 manuals and the (for that time) large number of 26 speaking-stops, and Exeter Cathedral (1818). Later contracts of importance were St.

Peter's, Walworth (1826), Christ Church, Spitalfields (1837), and the extraordinarily large two-manual organ of 40 stops at St.Olave's,
1) Southwark (1844), which was somewhat mystifyingly completed by Hill two years later.

LLOYD, C. (Nottingham; established 1859). This firm survived until the present century, and was succeeded in the nineteen-thirties by Roger Yates; Lloyd was fairly busily occupied in the last thirty years of the Victorian era in building modest-sized instruments of two and three manuals, of which representative examples were St.Peter's, Nottingham (1876; 3 manuals, 35 stops), and the Wesleyan Church, Rhyl (1882; 3 manuals, 26 stops).

MACK (Great Yarmouth). In the sixties and seventies, this builder erected or rebuilt many small organs in East Anglian villages and towns, including Cromer Parish Church (1867) and St.George's Chapel-of-Ease, Great Yarmouth (1874).

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1. Some light is thrown on the perplexing circumstances of this organ (to which reference was made on pages 67-8) by the following quotation from "The Memoirs of a Cambridge Chorister" by William Glover, 1885: "........a well-known firm had undertaken to build an organ on the express condition of equalling anything known in England. The attempt was made, and a fairly good organ was the result; still, the 'bond' was not considered to be fully executed. Further efforts ensued, and the builders were allowed to appoint their own umpires. Even then they could not 'pass' the instrument, and, whether from vexation for time wasted or other causes, the undertaking was finally abandoned. That almost unrivalled organ builder, William Hill, undertook the unusual task of re-voicing and finishing another man's work....." (op.cit., p.257, Vol.I)

MAGAHY, T.W. (Cork, Ireland). This firm was very active during the last two decades of the nineteenth century and in the early years of the twentieth. They were responsible for a large number of instruments in Southern Ireland, including those in Cork's two Cathedrals, St. Finbarr's (1889) and St. Mary's (1882), the latter being a three-manual of 42 stops.

MALEY, YOUNG AND OLDKNOW (London and Jersey). Most of this firm's work seems to have lain in Dorset and the West Country, as well as in London and Guernsey; and its most active period was from about 1870 onwards. St. James', Guernsey (1873; 3 manuals, 29 stops), and Wareham Parish Church (1882; 3 manuals, 34 stops) may be cited as prominent examples. In the late nineties, Alfred Oldknow did a certain amount of work on his own; and at one time, E. Maley was apparently building under his own name, probably in the early seventies.

MARTIN (Oxford). This firm, still in existence to-day under the title of Martin and Coate, carried out some important work in the Oxford area from about 1880 onwards, including numerous additions to the large organ in Radley College Chapel (1883-89-91), while in the London area Martin rebuilt the organ in Dulwich College in 1885.

MILLER (Cambridge). This firm began to make its name known in the Cambridge district during the eighties and nineties, with several good organs of moderate size. Miller was one of the first builders to experiment with electric action; Holy Trinity, Cambridge, had its organ fitted with action on the Hope-Jones system in 1892 — but unfortunately this mechanism lasted only two years.

MICHELL AND THYNNE (London). The short but brilliantly promising career of this firm was to all intents and purposes built round their celebrated organ in the 1885 Inventions Exhibition, afterwards erected in Tewkesbury Abbey, and already referred to in Chapter Four. The amount of time and labour which was put into this organ by the two partners had the almost inevitable result of making it impossibly uneconomic, and led to their eventual bankruptcy.

A very few other organs were built by them during this period; St. Mary's, Paddington (1887) was one of these. Thynne, as has already been remarked, entered upon another partnership after leaving Mitchell (vide "Beale and Thynne").

MONDAY, JOSEPH (Bristol). Sometimes spelled Munday or Mundy, this builder was stepson and successor of John Smith of Bristol (q.v.); among the organs with which he was concerned were those of Bristol Cathedral (1838), to which he fitted brass pedals, and Bath Abbey (1848).

MONK, ALFRED (London). He came into prominence in the eighties, and his firm is still in operation. His reputation spread quickly outside the London area, and Monk organs found their way to such places as Cheltenham and Bournemouth. Among his principal instruments were those in Greyfriars' Church, Reading (1887), with 3 manuals and 35 stops, and St.Joseph's, Highgate (1890), 3 manuals and 40 stops.

MORGAN AND SMITH (Brighton). This still-active firm began building in the nineties, mainly in its own town, but there were also overseas examples before the century ended (e.g. Simla Garrison Church, 1899). In this same year, St.Saviour's, Brighton was equipped with one of the firm's largest instruments of the decade: a 3-manual of 28 stops.

NICHOLLS, A.M. (London; d.1824). He was foreman and (almost inevitably!) son-in-law of George Pike England (q.v.); after England's death in 1815, his widow Ann England carried on the business with the help of Nicholls, until Nicholls himself died in 1824. Among the organs produced during these few years were those of Boston Parish Church (1820; 3 manuals, 23 stops) and St.Luke's , Chelsea (1824; 3 manuals, 32 stops).

NICHOLSON. Several organ-builders of this name appear during the nineteenth century; those of lesser importance may be mentioned first.

(a) NICHOLSON OF NEWCASTLE rebuilt his city's Cathedral organ in 1845, that of Hexham Abbey in 1860, and was still active later in the century, being for at least some of the time in partnership with NEWBEGIN.

(b) NICHOLSON OF BRADFORD operated about the middle of the century and shortly afterwards.

(c) NICHOLSON AND LORD of Walsall were prominent in the last twenty years of the century.

(d) NICHOLSON, JOHN (Worcester) was the greatest of all, and in 1841 he founded the firm which has remained one of the leading provincial builders from that day to this. His splendid instrument in Worcester's Shire Hall (1844) quickly marked him out as a man of advanced views, and he followed this by a steady series of admirable organs: Malvern Priory (1850), Manchester Cathedral (1861), rebuilds at Malvern (1880) and the Shire Hall, Worcester (1884), and Birmingham Cathedral (1894), to mention only a handful.

NORMAN AND BEARD (Norwich). The founder of this firm, Ernest W. Norman, was son of William Norman, a former employé of Walker and Lewis, who was forced by ill-health to retire early in life to Diss, in Norfolk. Ernest was apprenticed to Walker, and then set up in business in Diss about 1880. Later he was assisted by his younger brother, Herbert J. Norman, and the brothers were soon afterwards joined by G. A. Wales Beard;

and the firm was now known as "Norman Brothers and Beard, organ builders and tunists" (ugh !) with premises in Diss, Beccles and Norwich. One of the Norman brothers' early organs was in St.Mary's Baptist Church, Norwich (1886; 3 manuals, 29 stops), and it lasted effectively for nearly fifty years before it was rebuilt by the same firm. The name of Beard began to appear from about 1888 onwards.

The firm's reputation grew with extraordinary rapidity; a number of organs were built in co-operation with Hope-Jones, for instance in Llandaff Cathedral in 1898 and a 55-stop 4-manual for Burton-on-Trent Parish Church in 1899. The largest of Norman and Beard's own organs was in Norwich Cathedral (1899; 5 manuals, 64 stops), and another very fine instrument was the large rebuild in Bath Abbey in 1894. The firm is still in existence among the leaders of the craft to-day, having combined with the firm of Hill and Son in 1916.

OHRMANN AND NUTT (London). This partnership lasted from 1790 to 1803; Ohrmann, Snetzler's Swedish foreman, had begun business in 1780 and was joined by Nutt ten years later. In 1803, the year of Ohrmann's death, Nutt was joined by Elliott (q.v.). The firm must obviously have derived great advantage from its inheritance of the Snetzler premises and prestige; and a man who was accepted by Snetzler as his foreman must have been no mean craftsman. But very few records exist of work carried out by Ohrmann and Nutt; but among those few is one that gives some indication of the firm's status -- repairs and alterations to the St.Paul's Cathedral organ in 1802-3.

PARSONS, GEORGE (London). He was in business from the early years of the century (he rebuilt the organ in Wolverhampton's Roman Catholic Church in 1809) until 1840 or perhaps a little later. Between 1826 and 1840 his workshop was in Bloomsbury. Among his principal contracts were those at St.Magnus', London Bridge (1825) and Holy Trinity, Coventry (1829).

PORRITT, J. (Leicester; established 1867). This firm was engaged in very active production until quite recent years. Although most of its work was in the town and county of Leicester, Porritt organs found their way also into the neighbouring Midland counties (there were examples in Northampton, Coventry and elsewhere). The majority of Porritt's instruments, being intended for village or small town churches, were modest two-manuals, with very occasional larger specimens; for instance, St.Mary's, Leicester (1878; 3 manuals, 34 stops) and Buckminster Parish Church (1885; 3 manuals, 30 stops).

ROBSON, T.J. When the partnership of Flight (q.v.) and Robson was dissolved in 1832 as the result of a lawsuit, the Robson family continued with their own business until 1876, when their firm was taken over by Gray and Davison. A number of splendid instruments originated from their workshop: St.Michael's, Chester Square (1847) and the Buxton Road Chapel, Huddersfield (1850) have been mentioned already in earlier pages. Robson was twice engaged on the Temple organ, in

1849 and 1856/9 and examples of Robson organs found destinations overseas (in the Cathedrals of St.John's, Newfoundland in 1853 and Valetta, Malta in 1854, for instance).

RUSHWORTH AND DREAPER (Liverpool). Although this firm is usually thought to be of comparatively recent origin (indeed, the proud position it now holds is mainly the result of the last thirty years), yet in fact Rushworth organs began to appear during the seventies: Halsall Parish Church, 1874, was one of the first. By the close of the century, the firm's reputation, though still only local, was high enough for them to be given the contract for the 33-stop 3-manual in St.Peter's Pro-Cathedral, Liverpool.

RUSSELL (London). Hugh Russell was building organs towards the end of the eighteenth century, and he was succeeded by his son Timothy during the 1820's. (Another son, William, was the well-known composer and organist of the Foundling Hospital). Many City church organs passed through the hands of one or other of the Russells; for example, Foundling Hospital (1805), a 3-manual of 25 stops -- unusually large for the time -- as well as St.Anne's, Limehouse (1810), St.John's, Holloway (1828), St.Katharine Coleman and others. Russell's instruments seldom appeared outside London; Chelmsford Parish Church (1802-11) was one of his furthest ventures. The last of Timothy

Russell's organs was that built in 1858 for St.Philip's, Arlington Square.

Many strange things can befall an organ at one time or another; apart from falling to pieces through old age or neglect, it may be destroyed by fire, riot or bombardment; it may be machine-gunned (the organ in the German Church in Athens has some punctured pipes to this day as a souvenir of the "troubles" of December, 1944); or it may be shipwrecked (the original organ for Kimberley Cathedral met this fate, and was washed up on the shores of Algoa Bay, whence it was rescued some time later and transported overland by ox-wagon to its destination). But an organ very rarely disappears into thin air; yet Russell's name has the doubtful honour of being associated with this unique occurrence. The organ of St.Bartholomew's, Smithfield, was stored in Russell's factory during a six-year period while the church was undergoing repairs. Meanwhile, Russell died; the organ was accidentally sold among his effects; and when the church came to be reopened, there was no sign of the organ.

SCHULZE, EDMUND (Paulinzelle, Germany). Among the several foreign builders whose work appeared in Britain during the nineteenth century, none had a greater or more far-reaching influence than Schulze. He made his English debut at the 1851 Exhibition with a small 2-manual embodying several new features, which attracted the attention of many leading organists, including Dr.Hopkins; and during the next 22 years or so, he supplied the country with a number of instruments -- perhaps a dozen altogether -- which had a remarkable effect on the tonal design of British organs, not only directly, but also indirectly through the work of Schulze's followers, Lewis and Binns. All of Schulze's principal organs have been referred to in Chapter Three, where Schulze's ideals are discussed at length; and no more need be added at this point.

SEEDE, RICHARD (Bristol; fl.1787-1825). He was part of the splendid succession of Bristol organ-builders which began with his father, Bruce Seede. Richard's work was mainly local, and included the maintenance of the Cathedral organ for thirty-six years. His successors were John Smith (q.v.), Joseph Monday (q.v.), and W.G.Vowles (q.v.); and this continuous tradition of fine organ-building, spread over nearly two centuries, is unequalled in the provinces.

SMITH, JOHN (Bristol; fl.1821-35). Honourable mention was accorded to this builder in Chapter Two for his quite extraordinary organ in St. James', Bristol (1824), in the construction of which -- even if the principal credit as designer must go to Dr.Hodges -- Smith was a willing assistant and agent. Smith's work reached nearly all the important churches of the West, including such as Wells Cathedral (1830) and Bath Abbey (1835); and in Bristol itself there were the Cathedral (1821), St.Mary Redcliffe (1829) and Christ Church (1826-38).

SPEECHLEY, HENRY (London). He began business in the sixties of the nineteenth century, and soon began to acquire a reputation of national importance. He rebuilt the Exeter Cathedral organ in 1876 (though, being a three-manual of only 31 stops, it was quite understandably rebuilt and enlarged fifteen years later by Father Willis.) One of his best-known instruments was the 26-stop 3-manual in St. Nicholas, Cole Abbey, Queen Victoria Street, London in 1890. The firm survived into recent times.

STRINGER (Stoke-on-Trent; fl. 1874-9). He built some good organs in the Midlands and North Wales, including a 44-stop 3-manual for All Saints' Church, Derby, which afterwards became the Cathedral. The firm later moved to Hanley.

SWEETLAND, WILLIAM (Bath; established 1846). His early experiments with stop-keys have been mentioned; and he was the builder of a good number of modest-sized organs during the second half of the century, mainly in the South-West -- but not entirely (for instance, the Wesley Chapel, Lincoln in 1860). Typical examples of Sweetland's work were in St. John the Baptist, Glastonbury (1887; 3 manuals, 23 stops) and Christ Church, Bath (1892; 3 manuals, 31 stops).

TAYLOR, S. (Leicester; established 1886). This firm, which is still active, managed to produce a remarkably large number of organs in the final fourteen years of the century, nearly all in the Leicester neighbourhood. The majority were two-manuals of twenty stops or less, but among the larger instruments may be mentioned St.John's, Knighton, Leicester (1896; 4 manuals, 39 stops), Emmanuel Church, Loughborough (1886; 3 manuals, 26 stops) and St.Saviour's, Leicester (1878; 3 manuals, 25 stops).

TELFORD AND TELFORD (Dublin). This firm was established early in the nineteenth century and continued actively into the twentieth. Their rebuild of the Radley College organ in 1848 has been described; among their numerous other important instruments were those in Christ Church Cathedral, Dublin (1857 and 1878; a 4-manual of 47 stops), St.Patrick's Cathedral, Dublin (1831-65-82; 4 manuals, 56 stops) and St.Saviour's, Dominick Street, Dublin (1897; 4 manuals, 49 stops).

TRUSTRAM (Bedford). He built a considerable number of organs -- mainly small ones -- in Bedfordshire and Northamptonshire in the seventies and after, and was a typical example of the countless small provincial builders who did such sterling work in all parts of the country during the great days of British organ-construction. It is a matter for profound regret that so many of these firms have disappeared since the first World War.

VINCENT, H.S. (Sunderland). He began building in the seventies, and

WALKER, JOSEPH WILLIAM (London; 1802-1870). The founder of the great Walker firm was originally an apprentice of G.P.England (q.v.) and of Nicholls (q.v.), and was therefore in the direct line of artistic succession from Renatus Harris. He began his own business about 1827; in his early years he built many barrel-organs (they were almost a speciality of his). Among his first real organs of importance were those in Ludlow Parish Church and St.Mary's, Ealing (both in 1837) and in Armagh Cathedral, Ireland (1839)-- the latter instrument remaining continuously in the care of the same firm until its latest rebuild by them in 1954.

Walker's organs were renowned for their all-round excellence, and especially for their fine diapason tone; and both he and his youngest son, Joseph John (who remained at the helm until 1920, after the early deaths of three elder sons) maintained the firm's position in the forefront of their craft, where it still remains after more than 120 years of continuous activity. Many of their instruments have been mentioned; and all of them are thoroughbreds. The list of Walker organs does not include such a spectacular array of Cathedrals and concert-halls as that of Willis or Hill; but it is a very long list, with a large number of splendid organs of the forty-to-fifty-stop class, a figure which Walker hardly ever exceeded. He was early in the field of "organs for export", with instruments in the cathedrals of Antigua, West Indies (1848), Singapore (1861) and Honolulu (1862) as well as the English Church in Riga (1861).

WARD (York; fl.1800-41). Examples of this builder's work can be traced from Howden Parish Church, East Yorkshire (1800) until Doncaster Parish Church (1841). He is remembered chiefly for his outstanding organ in York Minster (1823), which with its 52 stops was, tonally and mechanically, years in advance of its time; it is discussed in detail in Chapter Two.

WEDLAKE, HENRY (London). He began business in the sixties, and his firm continued into the present century. Organs were supplied to all parts of the country, representative examples being Hardwicke Parish Church, Gloucestershire (1868), St.Clement's, Eastcheap (1872) and St.Stephen's, Guernsey (1888).

WHITELEY, CHARLES (Chester; established 1869). This firm's splendid organ in Chester Cathedral (1876) has been described in Chapter Three; and there were many other good Whiteley instruments throughout the North-West, as well as a few elsewhere (for instance, Heene Parish Church, Worthing, in 1881). The firm was still in existence in the twentieth century.

WILKINSON (Kendal; established 1829). The founder, William Wilkinson, made early experiments with electricity, (as has already been recorded) in the year 1826. He died in 1870 and was succeeded by his son Thomas, under whose lead the firm prospered, moving into its present large premises in 1886. At the 1885 Inventions Exhibition, the firm exhibited three of its inventions: an adjustable composition action, an improved check swell-pedal and an anti-friction blowing-apparatus. Among the firm's major instruments were those in Preston Public Hall and St.Michael's, Wigan (both in 1882) and St.George's, Kendal (1883) -- all of them three-manual organs of medium size.

WILLIS, HENRY (London: 1821-1901). So much has already been written about Father Willis in previous chapters that anything more than a formal mention here would be merely redundant. He was apprenticed to John Gray from the age of 14 to 21 (1835-42) and then for three years assisted W.G.Evans, a musical-instrument maker in Cheltenham, with whom he produced a two-manual and pedal free-reed organ, precursor of the so-called "American organ". Willis certainly owed much of his skill in voicing organ-reeds to his early experiments with the brass tongues of harmonium-reeds. A meeting with S.S.Wesley at Cheltenham led to Willis' being entrusted with the rebuilding of the Gloucester Cathedral organ in 1847 -- his "stepping-stone to fame", for which he received £400, a sum which he at any rate considered princely enough to marry on.

The tremendous figure of Willis towers over the whole second half of the century to such an extent that all those developments that originated from other builders are made to appear as a series of comparatively minor episodes -- episodes which, however, collectively make up a formidable corpus of achievement. It is, of course, mistaken to assume that Willis is the only man to whom the nineteenth-century British organ owes its almost phenomenal progress. Such is the impression one often receives from thumb-nail sketches of the period in general works on the instrument; but it is hoped that the preceding pages will have done something to correct this view, without in any way detracting from Willis' indisputable genius or belittling him either as craftsman or artist.

WORDSWORTH AND MASKELL (Leeds). This firm came into prominence in the final two decades of the nineteenth century, and continued into the twentieth under the name of Wordsworth and Company. Their field of operations covered not only Yorkshire but also the Midlands and Wales. One of their most important contracts before the close of the century was the rebuilding of the historic organ in St.Margaret's, King's Lynn, as a 48-stop 4-manual in 1895.

WREN AND BOSTON (Manchester). They formed part of the chain of succession between James Davis (q.v.) at the beginning of the nineteenth century and Jardine of more recent times. Sometimes recorded as Renn and Boston, they supplied organs to such major churches as Selby Abbey

(1825) and Ripon Cathedral (1834; a 3-manual of 26 stops). In about 1840, Wren (or Renn) was apparently in business on his own, for there is no mention of Boston in connection with the organ of Holy Trinity, Whitehaven in that year.

YOUNG, WILLIAM A. (Manchester; established 1870). This was another builder whose activity during the closing decades of the nineteenth century was quite remarkable, being closely linked-up with the rapid expansion of the industrial areas. Mainly in the North of England, but with some examples in Scotland and the Midlands, he built a considerable number of organs of small to medium size, very seldom exceeding 32 stops. One of these rare exceptions was in St.Thomas', Stockport (1890; 3 manuals, 37 stops). The firm remained in business into the present century.

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