Story of the Electric Organ

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by

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Portsmouth

Bardon Enterprises

First published in 1909 by Simpkin, Marshall,
Hamilton, Kent & Co., Ltd. London.

This edition published in 1997 by Bardon Enterprises.

ISBN: 0-9528184-3-4

Typeset and printed in England

by Bardon Enterprises.

Bound in England by Ronarteuro.

Portsmouth, Hampshire, England.

www.bardon-enterprises.co.uk

TO MY FRIEND,

DR. GABRIEL BÉDART,

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UNIVERSITÉ DE LILLE (FRANCE),

A LEARNED AND ENTHUSIASTIC ORGAN CONNOISSEUR,

WHOSE EXPERIMENTS, TABULATED RESEARCHES, AND

ZEALOUS ADVOCACY OF THE BEST SYSTEMS,

HAVE IN NO SMALL DEGREE INFLUENCED

THE PROGRESS OF MODERN

ORGAN BUILDING IN

FRANCE.

Preface.

In the following pages the Author has endeavoured to trace the evolution of the Electric organ from its earliest beginning, "Story" form being adapted in order to incorporate personal reminiscences of events and persons which otherwise would probably be lost to the historian.

Electric Organ Building is considered from the several points of view of the Historian, the Organist, and the Organ Builder, and much documentary evidence is introduced.

The Author's thanks are cordially tendered to many friends whose kind assistance has in many ways facilitated his labour.

He specially desires to record his obligations to Dr. J. Warriner, Dr. G. Bédart (Lille), Dr. T. Lea Southgate, Thos. Casson, Esq., Carlton C. Michell, Esq., and E. L. Monk, Esq., for valuable aid or suggestions received.

J. W. Hinton.

51, Granville Park,

Blackheath.

15th July, 1909.

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Introductory.

PRELIMINARY EXPLANATIONS.

The advance in Applied Sciences which marks the times in which we live, would appear to have the effect of sharply dividing intellectual types of mankind into two categories, *viz.* : Specialists (who generally understand only one branch, or ramification, of a given subject) and persons who frankly ignore the constitution of their surroundings.

To the majority of persons a telephone is merely a *telephone*, a train a *train,* and an organ an *organ* ; life is too short, they think, to worry about the nature or construction of such things. While this must be largely the case from the complexity and elaboration of modern inventions, it is presumable that those who endeavour to exercise the healthy inborn instinct of enquiry into their surroundings, acquire a wider grasp of life, and of all that contributes to the education and happiness of the individual, than can be possessed by persons who passively allow their faculties of enquiry and observation to become atrophied.

Among common objects of almost daily, or at least of Sunday life, the organ may I think be fairly included.

Everybody knows that it is not an orchestra, that it is governed by one man, called the “organist,” and that it has

keys and pipes ; but the actual knowledge they possess does not usually extend much further.

The spell which the tones of a fine organ diffuse through aisle and nave of some ancient cathedral has been felt by countless number of persons in ages past, as in our time ; indeed, as has been said by a well known writer "An organ when in the hands of a master at one of his best moments, is admittedly inferior to no source of the sublime in absorbing the imagination, and in ministering to the subjectiveness of the individual."

Again, is it not a daily experience of those who frequent Organ recitals and Church festivals to hear in the interval between the pieces, theories most paradoxical or insensate, advanced by neighbours in the audience speculating among themselves upon the means whereby the organ produces sounds, or is controlled by the organist?

Such being the case it seemed desirable to include a brief explanation of the structure of organs generally, and of the functions of their essential parts, couched in simple and untechnical language.

The first part of this work represents an endeavour to lay before the reader the simple story of the latest evolution of the King of Instruments, embodying brief records of the interesting careers of inventors and pioneers, whose labours have culminated in this evolution.

Readers versed in the technics of the subject are more particularly referred to the appendix, where the principal typical systems of Electric Action are explained and illustrated.

HOW MUSIC IS MADE IN AN ORGAN!

To the question "How is music made in an organ?" the answer is undoubtedly "By the pipes, which are virtually whistles of various sorts and sizes ;" the next and most important questions being "How does the wind get into the pipes?" and "How does the organist make it get into any particular pipe?"

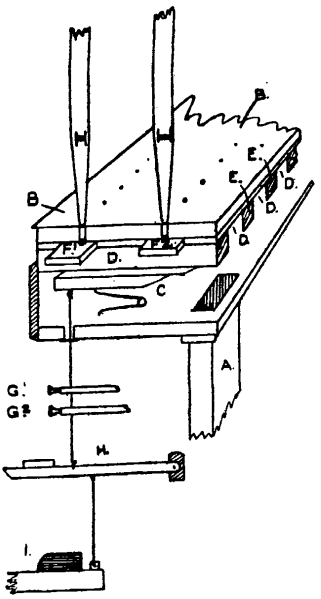

Diagram I

A "Trunk," or pipe bringing wind from the bellows into B.B.B.B., a rectangular box termed the "Soundboard."

C "Pallet," or little door, admitting wind to "Groove."

D.D.D. "Groove" (one to each note on the keyboard), or small air chamber supplying wind to such pipes as are set apart for any particular note on the keyboard, *e.g.,* all pipes sounding "C" are on one groove (the C groove) similarly in the case of every other note.

E.E.E. "Bars" separating the grooves, against which the pallets (C) shut.

F_1. F_2. "Slides" which push in, or draw out (as a drawer) admitting or intercepting the wind supplied by the pallet " C."

F (1) is shewn drawn, the hole being exposed by which wind is admitted to the pipe above.

F (2) is pushed in intercepting the passage of wind from pallet "C."

N.B.— These slides FF are moved by the stop handles G G (intervening mechanism omitted), each stop handle thus bringing into use, or shutting off a *series* of pipes corresponding in number to that of the keys.

H. Keys.

I. Pedals

K. Strings, which (in this simplified diagram) pull down the Pallet "C" and thus cause the speaking pipes above to sound (when the stop governing the series to which they belong is drawn).

Diagram I, on which are shewn the essential parts of an ordinary organ, will I think elucidate these difficulties,

moreover supplying a glossary of the few technical words which unavoidably occur in some parts of this work.

Speaking generally, and in reference to the diagram in question, "the way music is made" is as follows :— Compressed air from a bellows is driven up a suitable conduit (A) into a box (B.B.B.B.) called a "Soundboard," in which are as many little doors (C) as there are keys on the keyboard. Each key controls one of these little doors, which lets wind into a sounding pipe thus causing it to speak, as soon as the organist presses, the key.

Figs. I, II, III, shewn on *Plate* I give the working of the "slides" from many different points of view. These slides provide the means by which different sets or series of pipes can be brought under control of the keys either singly or in groups—a matter which, perhaps more than any other, puzzles those who examine an organ for the first time.

In *Fig*. I the slides are shewn black, and it will be remarked that the slide marked "off" is seen intercepting the holes. Similarly the black slide marked "on" being invisible through the holes, it will be evident that there must be other holes through the slide itself coinciding with the holes pierced in the board covering it, and consequently affording a passage clean through both board and slide.

Fig. II shews a slide "on" viewed in section.

PLATE I.

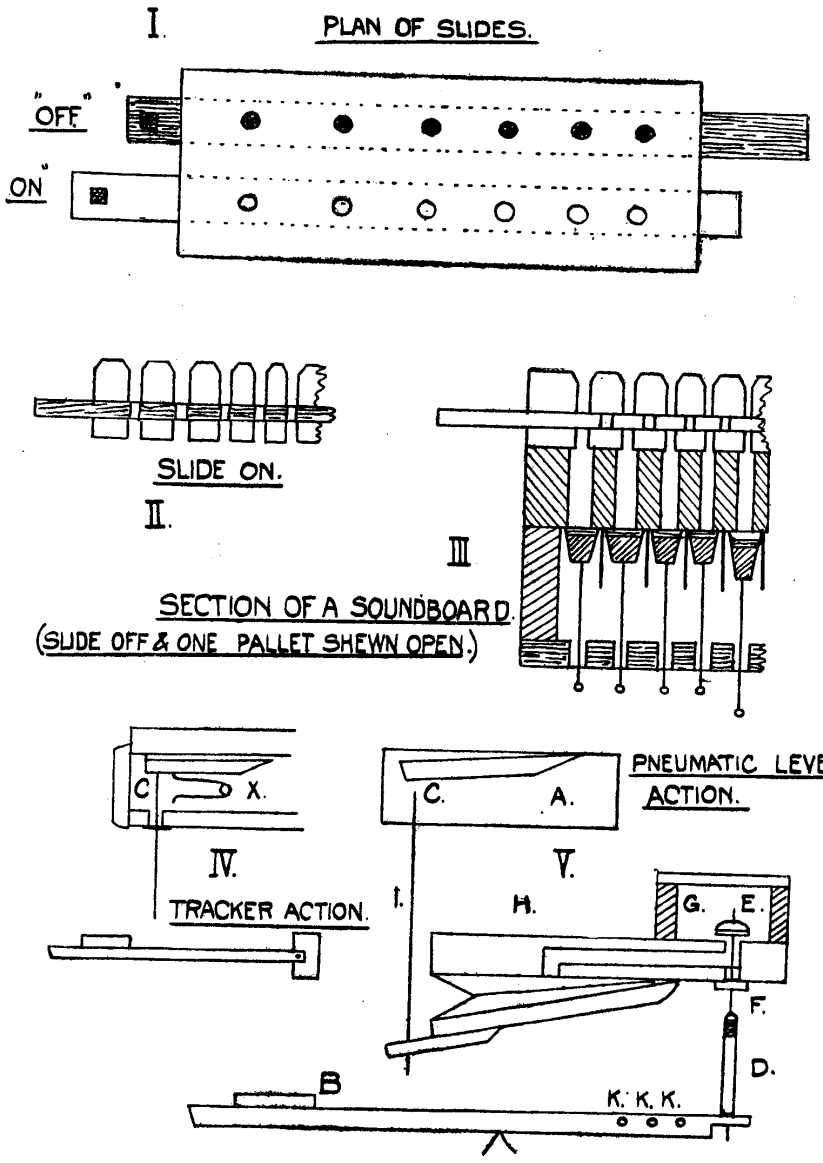
I.
PLAN OF SLIDES.
"OFF"
"ON"
SLIDE ON.
II.
III
SECTION OF A SOUNDBOARD.
(SLIDE OFF & ONE PALLET SHEWN OPEN.)
C
X.
IV.
TRACKER ACTION.
C.
A.
PNEUMATIC LEVER
ACTION.
V.
I.
H.
G.
E.
F.
D.
B
K. K. K.

Fig. III gives a slide "off" also in section, together with the *tout ensemble* of the sound board, shewing the ends of the pallets.

The foregoing diagrams illustrate the bare essentials of ordinary organ action reduced to their simplest expressions, the connexion represented by strings being, in practice, effected by small ribbons of wood termed "trackers," and the whole mechanism depicted is now commonly termed "tracker action" in order to distinguish it from other forms in which the strings or trackers are dispensed with.

Tracker action remains the most artistic and perfect medium of communication between the organist at the keys and the material sound-producing contrivances at his command.

It is the most perfect, *because the most simple,* inducing the minimum of distortion or detention of the most subtle impulses received from the player. As a medium, tracker action reminds us of a simple camel hair brush, or lump of chalk, with which an artist can execute his most varied conceptions, a result unattainable by the use of complex mathematical instruments.

Between this action and tubular pneumatic action—which converts organ playing into a kind of typewriting process, and effectually absorbs all the most subtle refinement of the players "touch"—there is a great gulf. It is, however, impossible to retain tracker action in large or even moderately large organs, as the physical, powers of the organist's fingers are a fixed quantity, which cannot be increased at will, so as to cope with increased mechanical resistance.

The most superficial student of the history of the organ can scarcely fail to remark that but little progress was made in organ building for the period of about fifty years immediately preceding the introduction of the pneumatic lever. Indeed all the essential details pertaining to ordinary organs had been established, and the best methods of carrying them out had been devised before the close of the eighteenth century.

Further developments seemed to be impossible, as a barrier, implacable as any of the laws of nature, effectually nullified every attempt, no matter in what direction made. This barrier, (to which I have previously alluded, resided in the impossibility of controlling the mechanical arrangements of large organs by the unaided physical strength of the human fingers ; in other words the size of organs was restricted by, and contingent upon, the muscular power of the player's fingers.

The removal of the limitation named, marks an important epoch in the history of organ building, and was effected by the introduction of Barker's "Pneumatic Lever," in which compressed air from the organ bellows was utilized to provide the motive power formerly supplied by the organist's exertions. An obvious, if familiar, illustration of the principle involved in the application of the pneumatic lever is afforded by the motor bicycle of the present time, the propulsion of which is independent of the rider's efforts, and merely subject to his control and direction.

A comparison of the Figs. IV and V on *Plate* I, will I think render the foregoing remarks additionally clear, and suffice to show both what a pneumatic lever is, and what it does.

Fig. IV illustrates the principle upon which ordinary organ action is constructed, the power necessary to pluck the pallet "C" off its seat against the resistance of the Spring X, and of the compressed air by which it is surrounded, being solely provided by finger pressure on key "B."

Fig. V represents a simple form of the pneumatic lever. The key (B) merely encounters the resistance involved in plucking the tiny valves E.F. from their seating. Air then passes through the channel "J" into the lever bellows H (Pneumatic lever), "H" is connected to the pallet C (I) thus opening it. It will be seen that in this case the power necessary to open the pallet C is supplied by the bellows H, and not by the organist's finger. Indeed (as the touch of the key would otherwise be unpleasantly *light)* the key tail must be loaded with leads k.k.k., or otherwise treated. If we compare the pneumatic lever to a steam engine, G is the reservoir of power, the boiler of the apparatus—the key (B) corresponds to the valve lever, H to the cylinder and "A" to work to be done.

Before proceeding further it is important to clearly lay down the fact that, while for the sake of brevity we may use the term Electric organ, there is really no such thing, as electricity can never be anything more than a mere accessory to the mechanical action of an organ. Some people imagine that an electric organ works entirely by electricity, it being even assumed that *sounds* are in some way produced by this agency.

Electricity however, only serves to transmit impulses, which are at the close of their journey transformed into power by *bona fide* organ appliances. The original (and infinitesimally light) impulse received from the finger of the

organist is, after passing through the wire, converted into *power* by the pneumatic action, in which the wire terminates—just as mere touch on the terminals of a submarine mine is transformed into the stupendous power of exploding dynamite, as soon as the electric impulse has travelled through the wire. Thus it will be seen that electricity is dependent on the help of pneumatics, and must be associated with Barker's "lever," see *Fig*. VI, or combined with some improved pneumatic appliance.

Had there been no pneumatic lever, there could have been no Electric organs, consequently organ action to which electricity is applied must be termed Electro-pneumatic.

It may seem pedantic to insist upon this distinction but in these days of advertising quacks who distort the smallest verbal modification into the symbol or differentiating sign of their so-called "inventions," it is very essential that things should be called by their right names. Electro-pneumatic action is intended to carry the principle embodied in the pneumatic lever yet further, claiming (1) To do away with the noise inherent to the ordinary pneumatic lever in use at the time of its invention (2) to enable organs to be played from any position, their parts being placed anywhere, and not necessarily contiguously.

Electro-pneumatics share both these advantages with the later offshoot of pneumatic lever, viz. :—Tubular pneumatics.

Any lengthy or exhaustive discussion of the relative advantages of these systems of organ building would here be totally out of place, but some differentiation of the essential

qualities of each, so far as they concern *organ players and their audiences*' would seem to be desirable.

Tubular pneumatic action, invaluable for stop control, outstanding blocks of pipes, speaking fronts, and a thousand and one other details of organ construction, is imperfect as a medium of direct communication between the artist who presides at the keys and the pipes he governs. When the tubes are short and fairly straight the imperfection is so very slight that it can be ignored, or condoned for the sake of the great facilities this system offers for the multiplication of couplers and stop changing devices, which are more cheaply effected than is possible in any other way.

When however the tubes are long, or contain sharp bends, the result is often disastrous, instances of which can be observed in the case of not a few large and costly tubular organs. *There are only three perfect actions in existence*, so far as the transmission from the brain to inanimate sound-producing factors is concerned. They are mechanical actions (*a*) Mechanical only—up to a limited number of stops, (*b*) Mechanical with Pneumatic Lever, (*c*) Electro-pneumatic.

It must not however be inferred that I hold a brief for Electro-pneumatic action ; far from this, I only regard it as one colour on an artist's pallet, *to be used when required,* and not as being a colour intrinsically better than any other.

Electro-pneumatics come to the organ builder's aid when the distance between clavier and pipes is too great to admit of the use of other means, consistently with perfect silence in the action and *absolutely* prompt speech—a condition of things which may exist even within the limits of

the case of a very large instrument. Tubular organs will hold their own, as tracker organs have done, *i.e.* up to a certain extent, the limit of their efficiency being fixed not by the *physical power* of the organist (as in tracker organs) but by the *distance between key and pipe,* and (especially) by the degree in which the *radical defects of* tubular transmission applied to the manuals are condoned or accepted by musicians generally as normal.

F. Fink records his impressions* of tubular pneumatic work in the following terms :—

"The various difficulties which limit the use of mechanical or semi-mechanical actions, would appear to have been swept away by the invention of Tubular pneumatics.

"Unfortunately, however, there are serious drawbacks which in large instruments unavoidably attend the introduction of this system, and open a wide field to organ builders in their search to remove or palliate these shortcomings.

"Tubular transmission is only possible when the distance to be traversed is short, or moderate ; lack of precision of attack and finish in the speech of the pipes becoming more and more evident as the tubes exceed 45 feet in length. When the distance is doubled or nearly doubled, a general smeariness of effect pervades the music rendered—often most unpleasantly ; the harmonic masses which the organist creates and controls being a mere musical hotchpotch or porridge (stumffer tonbrei)."

* F. Fink "Elektrische Orgeltraktur" (Albert Auer, Stuttgart, 1909). An interesting treatise on Electro pneumatics.

Other decisive opinions upon the merits of tubular pneumatics are the following, but it is reasonable to suppose that they are entirely based on experience of Kegellade and sliderless work.

(1). In France, M. Gutchenritter reverts to tubular pneumatics …. "Is it possible that in France—the sanctuary of Electric organ building—there should be a return to the worst of all systems of transmission—tubular pneumatics …. and we have to say that German blood flows in the veins of this Gutchenritter (In den adern dieses Gutchen ritter deutches blut rolt.")

M. Allihn,

Zeitschrift fur Instrument bau, Feb. 1, 1909.

(2). "Tubular pneumatics afford the most odious form of transmission in organs imaginable."

"Die scheustlichste aller denkbarren tracturen."

Herr Rupp,

Musik director and Organist, Strasburg—

(quoted by Allihn.)

These drastic utterances, while in truth applicable to only too many tubular organs of all kinds, would I am sure have been limited or qualified if the writers had been acquainted with many systems used in England, and especially Mr. Vincent Willis' latest system.

It is, however, strange to note that even these writers who are so vehement in their condemnation of tubular pneumatics *fail to seize a cardinal point*, which should put most German and American systems of sliderless pneumat-

ics out of court with all who hold that in art "only the best is good," and that systems should be eschewed, which, from some physical and unremovable defect, avowedly or demonstrably fall short of the relative perfection of others.

The point is simply this. Beyond the relative slowness of sliderless work (especially when many stops have to be governed) *not a single pipe speaks properly or repeats really properly* in iterated passages, as they lack the buoyancy of the air contained in the grooves of slider soundboards. The value of this buoyancy of air cannot be ignored even by those who commercially advocate sliderless work. Mr. Lewis' treatment of grooves and soundboard-wells is well known, and Father Willis achieved his best results by further grooving every pipe on the upper board, thus increasing the volume of buoyant air behind each pipe *to the utmost extent possible*.

As I have previously been at much pains to point out that I do not advocate the use of electricity except under circumstances which compel its introduction, I may interpret M. Fink's statement as a protest against the toleration of slight defects which could be entirely removed by the use of electric action, further pointing to the need that we should guard against becoming so inured to the smeariness of tubular pneumatics that in the near future we shall consider it a necessary evil, or in *inevitable concomitant* of organ tone. We have already forgotten what the taste of good tea can be, we have forgotten what real brandy is and seem to accommodate ourselves to chemical substitutes ; and we have forgotten the luscious beauty of even the simplest chords played on an organ tuned to unequal temperament.

It is obvious that the two first cases are instances of "Hobson's choice," the last one being the result of the deliberate acceptance of an evil as the lesser among several, but where is the necessity to educate the ear to "hear things in a fog?"

Of course I am now speaking of articulation tone purely from an art point of view, thus condemning every imperfection which is susceptible of being corrected, and ignoring any compromise with questions of monetary cost ; a standpoint absolutely Utopian in the eyes of most persons except of the very few who seek for perfection, and are sufficiently blessed with this world's goods to bear the cost it entails.

II

Early Experiments.

DR. GAUNTLETT, MONCEL, FROMENT,
STEIN, MR. GOUNDRY.

Henry John Gauntlett was the eldest son of the Rev. Henry Gauntlett and was born at Wellington (Salop) in 1806. He was educated at home chiefly by his father, and at a very early age showed unmistakable talent for music. As might be expected from the influences and environments of his early days his musical gifts were directed to sacred music, with which he remained indissolubly associated throughout his whole life.

During Gauntlett's early childhood his father was presented to the vicarage of Olney, Bucks, and when nine years of age his little fingers had acquired sufficient skill and strength to enable him to play the organ at the services. At the age of seventeen, Attwood expressed a desire to take him as a pupil, but his father intending him to take holy orders, demurred, and eventually it was decided that he should be articled to a London solicitor. On reaching his twentieth year Gauntlett went to London and entered upon his articles, becoming Organist of St. Olave's, Southwark very shortly afterwards. (There is a beautiful and lifelike painting of Dr. Gauntlett in the vestry of St. Olave's but the best memorial of his association with that church is the organ, which was designed by him).

It is regrettable that this instrument has not been rescued from its sad condition of neglect and decay, and acquired by some institution or connoisseur, being as it were a landmark in the history of English Organ Building.

In 1831 Gauntlett was admitted a solicitor, and soon after that date he commenced to practise in Gray's Inn, one of his brothers having joined him in partnership.

A few years later (circa 1835), having already become widely known as a composer of hymns and an organ player, Gauntlett entered on what may be considered to have been the great work of his life, namely his memorable crusade against the *GG* Compass of organs, then practically universal in this country.

The celebrated organist and composer, Dr. Wesley, proved to be Gauntlet's most serious opponent in this matter, and for many years no little strife prevailed, English organists dividing themselves into two camps, called "G" or "C" men according to the leadership they accepted.

Irrespectively of considerations more important, forming the real grounds of contention between these two eminent men, the lack of uniformity in compass and in general arrangements of English organs at that period could only be pronounced a crying evil to be removed.

Viewing the situation from this standpoint, uniformity of compass—be it what it might—being the main desideratum the attainment of this result conferred a mighty boon on English organists generally.

It seems, however, a pity that English organs could not have been left undisturbed a few years longer, by which

time musical and general education having progressed mightily, the details of the question of conversion would have been settled by committees more enlightened and representative, than could at that time have been convened.

Taking all things into consideration it was unfortunate that the benefits of uniformity of compass should have been attained by cutting the Gordian knot rather than by untying it ; for thus, through the individual and almost unaided efforts of an enthusiast who did not see Further than the abstract point for which he was fighting, and consequently did not realise all the side issues involved, it came to pass that unscrupulous persons interested in the spoils of valuable pipes to be "annexed," or in the commissions to be derived, reaped no small gain from their interested advocacy of the "conversion" of G into C organs.

Clergy, churchwardens and organists were at that time alike unable to judge the merits of such questions, and ignorant of the intrinsic value of the organs of which they were the custodians.

As might be expected the mere plunder of pipes did not satisfy many of the vandals to whose hands these unhappy organs were entrusted ; the work of conversion itself was usually badly executed, thus bringing about the deterioration, and ultimate destruction of the instruments "converted."

It is curious to note that while Gauntlett's motive for upsetting the order of things existing in his time was almost solely a desire to facilitate the performance of Bach's organ music, Wesley, his opponent in the matter of organ compass, was equally, or, if it were possible, still more devoted

to the study of Bach, and laboured unceasingly to introduce the great German master's works in England.

Had English organists followed the more cautious lead of Dr. Wesley, the vandalism which resulted from the hasty "conversion" of organs would probably have been avoided, and the C compass would have evolved itself naturally, as organists came to realize its advantages, but this episode of bygone history cannot here be dwelt upon. See Appendix ("A Forgotten Controversy.")

The principal organ appointments held by Gauntlett were Christ Church, Newgate Street,* Union Chapel (Non-conformist) Islington, which he held for thirteen years ; St. Bartholomew's-the-Less, Smithfield, and All Saints, Kennington Park. In 1842 Dr. Howley, Archbishop of Canterbury, conferred on him the degree of Doctor of Music, about which time he gave up practising as a solicitor, devoting himself entirely to music. Four years later he had attained to such celebrity that he was chosen by Mendelssohn to take the organ at the first production of the oratorio "Elijah" at Birmingham (August 26th, 1846).

In conjunction with Charles Child Spenser, Dr. Crauntlett published a work of Gregorian plain song ("Hymnal for Mattins and Evensong," Bell and Daldy, 1844), but the editing of collections of hymn tunes appears to have been his favourite pursuit, some of the best known being "Church Hymn and Tune Book" 1844, "Cantus Melodici" 1848, "The Congregational Psalmist" (with Dr.

* During Dr. Gauntlett's tenure of this appointment a new organ was built for that church, and he contributed a very handsome sum towards its cost from his own private means.

Allon) 1851, "Carlyle's Manual of Psalmody" 1860, "Tunes New and Old" 1868, etc., etc.

The career of this remarkable man would seem to have been made up of many efforts in different directions, impulsively effected ; perhaps a natural outcome of an education extended over an unusually wide field. It is hard to think that the pen which wrote "St. Alphege," "St. Albinus," "St. George," "St. Magnus," "Irby," and a host of other tunes, which will probably be dear to many succeeding generations of worshippers, and are stamped with excellence of the highest order, could have brooked to collaborate with Charles Child Spenser in attempting to revivify so much that was shapeless, dead, and unprofitable in plain song ; and it is passing strange to find Dr. Gauntlett straying from the Church, to organise and conduct music most unclassical in character, at Dr. Allon's Chapel.

Again, it is perhaps surprising that Dr. Gauntlett never aspired to become a composer in the full sense of the word. His general culture, and perceptive abilities, should have made the acquisition of the necessary training not only easy, but also rendered it a duty incumbent upon him ; this however was not to be, as Psalmody in some form or other (while perhaps the lowest rung in the ladder of Church music, and one apt to appeal but little to musicians whose culture enables them to deal with the higher forms of music) was apparently the centre round which his thoughts revolved, from the time he first played a service until his death.

Dr. Gauntlet's connexion with the electric organ is so important that it seems preferable to separate this episode in his career from the foregoing brief epitome.

So early as 1851 Dr. Gauntlett had conceived a project for playing all the organs at the Great Exhibition of that date from a common console, either separately or simultaneously, and before the close of that year he approached the Exhibition Committee on the point. This idea was scouted as impossible and nothing resulted therefrom, but as soon as the Crystal Palace Company was formed, Dr. Gauntlett, nothing daunted, suggested to them that they should erect facsimiles of the eight most celebrated organs in Europe—to be played all together, or separately, from claviers under the central transept ; laying great stress upon the fact that the prospectus of the Palace put forth an exhibition of still life only, and assuring the executive Committee that any exhibition conducted on these lines would inevitably result in financial loss if unaccompanied by music. This latter statement was not received with favour by the committee, and two of its members, Messrs. Anderson and Fuller, expressed themselves very strongly upon it.

"Dr. Gauntlett," said Mr. Fuller "you will never hear a note of music in the Crystal Palace ; the Exhibition is intended for higher purposes. We do not want music, and we will not have it."

Thereupon Dr. Gauntlett picked up his hat—and having reiterated the opinion that without music the whole affair would result in bankruptcy—took his departure.

It was indeed fortunate that Gauntlett's wild scheme was not accepted, as the means by which he proposed to carry it into effect (as embodied in his patent of 1852) were totally insufficient, and would have resulted in a disastrous *fiasco* ; his energetic attitude however, in the matter, most certainly may be considered to have afforded encouragement