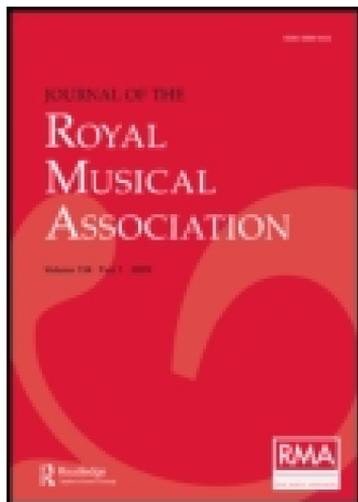


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On: 13 November 2014, At: 23:09  
Publisher: Routledge  
Informa Ltd Registered in England and Wales Registered  
Number: 1072954 Registered office: Mortimer House, 37-41  
Mortimer Street, London W1T 3JH, UK



## Proceedings of the Musical Association

Publication details, including  
instructions for authors and  
subscription information:

[http://www.tandfonline.com/loi/  
rma18](http://www.tandfonline.com/loi/rma18)

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Published online: 28 Jan 2009.

To cite this article: T. L. Southgate Esq. (1881) On Various Attempts  
That Have Been Made to Record Extemporaneous Playing, Proceedings  
of the Musical Association, 8:1, 189-196, DOI: [10.1093/jrma/8.1.189](https://doi.org/10.1093/jrma/8.1.189)

To link to this article: <http://dx.doi.org/10.1093/jrma/8.1.189>

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*ON VARIOUS ATTEMPTS THAT HAVE BEEN MADE  
TO RECORD EXTEMPORANEOUS PLAYING.*

By T. L. SOUTHGATE, Esq.

MOST of the members of this Association are doubtless aware that from time to time efforts have been made to obtain a permanent record of music played extemporaneously. A little consideration of some of the conditions attached to our art will show the desirability of successfully achieving such an aim. Before this assembly there is no need to dilate on the fact that the trained composer is just as able—so to speak—to hear with his eyes, as ordinary people are to understand the import of words from silently reading them. The musician composes, or should at least write down his ideas, at the desk; indeed, in the case of orchestral or elaborate polyphonic music, no other course is practicable. This is the sound and proper method; and so long as intelligible “form” rather than disconnected rambling is recognised as an indispensable necessity on which to build, so long will the trained composer prefer the comparative slowness of writing at his desk, to dashing off his, perhaps cruder, ideas when sitting at his instrument. But having admitted the advantage of this mode of proceeding, we must not forget that there is also another side of music-art that ought not to be overlooked, and that is extemporaneous playing. I need not waste your time by dwelling on the various grades of this feature. Such extemporaneous playing as consists of fearful and wonderful chords, more or less vague, coming from nowhere in particular, and leading to the same place, that one too frequently hears doing duty as an involuntary in our churches, or the astonishing preludising of youthful scramblers on the pianoforte, cannot too soon be forgotten. But above and far beyond these immature essays is the playing of true artists, whom nature has richly endowed with the faculty that we term inspiration. How often has one heard said by those who have been moved by such performances: “What a pity it is that such fine music should be lost!” The names of many of those gifted beings who have shone in this branch of music are known, and some of us can even recall the impressions of delight with which we heard them play, but the music itself is lost. Happily, most of the great improvisors have also been composers, and have left on their written works the impress of their genius. Still, we should have liked to possess some record of the music they

gave forth when the spirit moved them, and the listeners heard with outward ears the most inward thoughts of such musicians. We have numbered among our own countrymen great players of this type—amongst others the names of Roseingrave, Crotch, the two Wesleys, Sterndale Bennett, and Henry Smart must recur to the memory of us all. Nor is the race extinct; we still possess, I am glad to say, musicians whose extemporaneous performances are marked by good taste, rich fancy, and sound musicianship. Many such artists play much, perhaps, but write little. The inexorable round of daily duties, the incessant occupation of teaching, the want of quiet leisure, are often (and truthfully) pleaded as some of the excuses for not publishing more. To such musicians an apparatus that would set down, what one may term, their fleeting thoughts when they have anything worth saying, would be an unquestionable boon. Moreover, it is worthy of consideration that, like as the orator is more fervid and eloquent than the slower literary writer, so the performing musician is frequently more impassioned, and has what the Germans term more *Geist*, when engaged in the exposition of his art, than when seated slowly setting down his ideas at the desk. We all know that happy thoughts and graceful modes of expression too often escape one before they can be got upon paper. Thought is frequently so momentary that it is gone before we can arrest it; indeed, it is popularly said that these lost thoughts are often the best.

To digress a moment. The late well-known critic, H. F. Chorley, in his "Modern German Music," writes thus of Hummel's impromptu playing, which he heard when on a visit to Weimar in 1840: "By none who have heard Hummel's improvisation can it ever be forgotten. It was graceful, spontaneous, fantastic. The admirable self-control of his style as a player (displayed in a measurement and management of *tempo* unequalled by any contemporary or successor that I have heard), so far from leading him to hamper his fancy or humour, enabled him to give both the fullest scope, inasmuch as he felt sure that he could never ramble away into a chaos, under pretext of a flight across dreamland. The subjects he originated in improvisation were the freshest, brightest, most various conceivable: his treatment of them could be either strict or freakish, as the moment pleased;—or he would take the commonest tune and so grace and enhance and alter it, as to present it in the liveliest forms of a new pleasure. I remember once to have heard Hummel thus treat the popular airs in Auber's 'Masaniello' for an hour and a half, throwing off a Neapolitan fantasia with a felicity in which his unimpeachable beauty of tone and execution were animated by the bright beauty of the south, as he wrought together the Chapel Hymn and the Fishermen's Chorus and the Tarantella, and Masaniello's air by the side of the sleeping Fenella." Referring to the affected depreciation of this great composer—

a composer, I may remark, whose misfortune it was to have lived at the same time, and so to have been overshadowed by the still greater genius of Beethoven — Chorley continues: "It is well known that the gift of musical improvisation can be cultivated so far as readiness, order, and even climax are concerned; that the fancy, too, can be set free by exercise; but it is hard to conceive that he, who was the most various and the most masterly of modern *improvisatori*, should have been a mere machine into which so much learning had been crammed: and thus it is with regret that I have always fancied him undervalued and disparaged among those very persons of taste and philosophy whose boast it was to penetrate through forms and incrustations to the innermost heart of Nature."

I think it will be conceded that any mode of permanently recording happy, but fleeting, impressions will certainly prove welcome and, let us hope, useful. Such a result will at least save time, and in this busy age this alone will be of value. Far too much good paper is already spoilt by being used for the supply of what is termed "new music." I hardly think that a "note writer-down" will materially increase this supply. Although a dilettante may use such an apparatus to give to the world his prized ideas, cherished thoughts, or vague ramblings, the instrument must exist chiefly for the true artist whose merits cultured people have already assessed and recognised.

As my main object is to direct attention to the apparatus kindly sent here by Mr. Wallis, of 135, Euston Road, for your inspection, I will detain you but a short time over the historical account of pieces of mechanism of this character.

A clergyman of the name of Creed appears to have been one of the first to think of constructing a "Melograph." In the year 1747, he sent a communication to the Society of Arts demonstrating "the possibility of making a machine that will write down extempore voluntaries or other pieces of music as fast as any master shall be able to play them on the harpsichord." There is no record, however, of any such machine having been made according to his proposal. It is said that some such apparatus was constructed in 1770, by a monk named Engramelle, but there are no particulars known of this. In 1774, John Frederick Unger, burgomaster of Einbec, suggested a machine for this purpose, and made some designs for it, which obtained the approval of the Academy of Sciences at Berlin. A description of this scheme was subsequently printed, with copperplate illustrations, at Brunswick. The first to make a practicable machine was a German named Hohlfield. The invention is mentioned by Burney in his volume of Travels; it consisted of two cylinders, moving paper between them, on which, by means of a crayon, each key when pressed down by the player caused a mark to be made. The apparatus had obviously many defects, but the Berlin Academy rewarded

the inventor with a handsome gratuity. In 1827, M. Carreyre exhibited before the Fine Arts Committee of the French Institute a melographic piano, which consisted of a clockwork movement unwinding from one cylinder to another a thin plate of lead, on which were impressed by the action of the keys certain peculiar signs, which required to be translated into ordinary notation by means of an explanatory table. Although a commission was appointed to report on this matter, no report seems to have been presented, and the machine was evidently not a success. A M. Boudouin afterwards read before the same body a paper concerning another piano of this kind, but nothing is known of his scheme. In 1836 an Englishman, Berry, took out a patent for an apparatus of this character. It consisted of a revolving cylinder carrying paper, which was marked by pencils depressed by the pianoforte keys. As an alternative for the lead pencils, he proposed metal points, which caused the paper to be marked through pressing black carbonised paper against it. This patent is a little important, as it shows the first attempt made to indicate the length of the bars. The inventor suggested that this could be accomplished by beating regular time on a foot pedal: mechanism connected with this punctured the moving paper, thus dividing it into definite spaces. The patent contains a description of elaborate arrangements for deciphering and transcribing this sort of musical shorthand. There appear to have been a good many pedals, cranks, and other appliances connected with the machine, and altogether I am doubtful as to whether it was workable. In 1856, I. Merzolo, an Italian, took out a provisional patent for an apparatus to give an "identical reprint or repetition with types like those used in ordinary printing." The specification is very brief, and though one drawing is given with it, the whole thing is so vague and hazy that it conveys no definite information as to how the object set forth could possibly have been accomplished. So far as I am aware, no further serious attempt was made in this direction until the year 1863, when a Mr. F. Beverley Fenby, of Worcester, took out a patent for such an apparatus, which he termed "The Electro-Magnetic Phonograph," employing (as you may remark) the same word Edison used some sixteen years later for his ingenious piece of mechanism for audibly reproducing sounds. An Englishman was thus the first to employ electricity for the purpose of recording music. Fenby's instrument was of the most elaborate nature, its main principle was that which governs all telegraph machinery: viz., the making a soft piece of iron into a temporary magnet, and thus, by the motion obtained, causing a small inked wheel to be pressed against a band of moving paper. The specimen of the music printed, attached to the copy of the patent, to a certain extent resembles that which Herr Föhr's apparatus produces. I have not been able to find out whether this machine was ever constructed. According

to the description furnished, it was so complicated, that I doubt very much whether it could have successfully carried out all the operations that its inventor therein set forth; its cost must necessarily have been considerable. In the year 1864, M. F. J. Endres applied for a patent for an invention of this kind, but for some reason this was refused to him. His plan seems to have been to have as many type-wheels as there were pianoforte-keys, kept revolving; on the periphery of these wheels there were cut notes of various values, from a semibreve down to a demi-semiquaver. Upon the finger rising from a note struck, the intention was that the revolving wheel in connection with this should print on a band of paper a note of the exact time value of the sound played. The intention was good, but a careful examination of the mechanism proposed shows that it could not possibly accomplish this aim. I should imagine that the inventor could have been but imperfectly acquainted with musical requirements, for he arranged that pedals or sliders were to be used each time an accidental was to be played. Like many other so-called inventions on the files of the Patent Office, Endres' scheme was a mere chimera, and quite unworkable.

The idea of a series of pencils depressed by the action of the keys upon a band of paper is one that must obviously occur to any person thinking for a moment on this subject; consequently it has been suggested in various forms by would-be inventors again and again. One cannot be surprised at this; but that they should rush to the Patent Office to obtain official protection for their very original idea is certainly a little surprising. And I cannot but say that it is not to the credit of that antiquated department of our governmental system that it should so readily take the fees and grant patents for schemes that lack novelty, practicability, and usefulness. I say this much, because there are no fresh ideas in the patents obtained by Schwetz, a German, in 1879; Hoyer in 1880; and Groth, a Swede, in the same year. With slightly different modifications all these persons suggest, what may be briefly termed, the pencil arrangement; apparently the lead of these pencils is never likely to become worn away and exhausted, for no mode is provided for keeping them fit for the work required of them.

In the journal *La Lumière Electrique* is an account of an apparatus which was shown at the Paris Electrical Exhibition of last year. The inventor, M. J. Carpentier, terms it "Le Mélographie Répétiteur," and it was exhibited attached to a small harmonium. Its enthusiastic designer, evidently having the perforated cards of the Jacquard loom in his vision, states that it writes down ordinary music played on the keyboard "*dans le langage de Jacquard*," and then reproduces it as often as may be desired on the instrument again. The process is effected by means of electro-magnets in con-

nection with the keys, putting into action a series of cutters which cut slits in a band of moving paper, the slits corresponding to the length and position of the notes. By an after arrangement, the perforated paper subsequently allows the wind to pass through its slits, and thus reproduces the music previously played. M. Carpentier states that he intends to make the machine print in ordinary characters that which the improviser has played, but he considerably warns the reader that this is at present only a project. I may just stay to point out that this is an impossibility, such an operation requiring that which no machine can ever possess: viz., a brain, and power of varied and independent thought.

In April, 1880, Mr. H. J. Dickinson took out a patent for an apparatus of this nature. I am unable to say whether his proposal has been carried out, or to describe the machine; but, from the meagre account given of it in the specification, its principle seems to have been similiar to that of the Casselli electro-chemical telegraph, and therefore it is analogous to Herr Föhr's apparatus. A Mr. Thwaite, an organist at Bolton, in a letter to the Editor of the journal *Engineering* in December last, states that some years ago he devised a melograph. Its principle was to press needles against a revolving drum covered with transfer paper; the paper being punctured by this operation. I think that the success of a machine so constructed would be very doubtful.

There also was patented last year, by M. A. P. Hodgson, of Paris a very elaborate "Apparatus for correctly transcribing musical compositions." The patent is numbered 573; it is difficult to understand, the translation from the French being imperfectly done. The inventor, who styles his instrument the "Pianograph Metronome," says that in all previous apparatuses "the infinite variations of the unity of movement was overlooked." This in plain English means, that the time was not indicated; and he goes on to say that "since the application of Messrs. Winkel and Maëzel's chronometer to music this has become possible." There is no need to waste time by describing in detail this complicated piece of mechanism. The extraordinary table given, "showing the variation of the unity of duration" and the algebraical description of the vibration of a pendulum, may possibly interest mathematicians, but they are of no practical use to musicians. The odd direction that "the composer should end his composition by a perfect chord in the key of F, and not by the tonic, a third, or a fifth," is quite enough to show that the inventor of this apparatus must have a very limited and imperfect notion of the nature of extemporaneous music. Briefly I may say, that the machine prints with ordinary ink on a band of paper, lines representing in their length the duration of the notes held down. The metronome governs the rate of motion the driving cylinder revolves at, and it is

thus supposed, to regulate the time. I say supposed, because, in the first place, one hardly ever plays in absolutely accurate time, and so, an unyielding clockwork arrangement would certainly not synchronise with a person's playing as to the precise bar divisions; secondly, because by such an arrangement no provision could be made for indicating *accelerandos*, *ritardandos*, or any form of *tempo rubato*. M. Hodgson's complex mechanism, with all its pretension, accomplishes very little.

We now come to the "Music Electrograph" before you. I happened to pass through Stuttgart last year, and saw the apparatus at a small, but very excellent exhibition which was open at that time in the Wurtemberg capital. A notice which I wrote of the invention appeared in the *Musical Standard* of last November, and, in consequence of the attention the matter obtained, Herr J. Föhr brought one of his machines over here, and has since sold the English patent. This gentleman, I may mention, is not a musician, but is the secretary of the Telegraphic Administration of Stuttgart. The mechanism of this *Electro-chemischer Notenschreib-apparat*, as he terms it, is so simple that but a few words are necessary in order to describe it. Shortly, I may say that there are a series of contact buttons, running through a long rail or register placed over the back part of the pianoforte keys; these buttons, by means of insulated wires, are in connection with platinum styles or points which press on a band of paper, stored on a drum, and is unwound by means of clockwork. The paper as it passes through the machine is saturated with a chemical solution of ferrocyanide of potassium, sulphuric acid and water; it is afterwards ruled, by means of an inking roller, with the usual lines of the staves, and some dotted ledger lines above and below. On a pianoforte key or keys being depressed, what electricians term a circuit is completed, and the current runs from a Leclanché battery, passing through the saturated paper by the particular style or styles in connection with the keys struck, and staining it a bluish colour; this is owing to the electric current decomposing the salt with which the paper is charged. The length of the stain depends on the precise time that the pianoforte key is held down; a semibreve, for instance, appearing as a long streak, while a quaver would be but a dash, and a demisemiquaver a mere dot. The blank spaces on the paper represent the periods of silence, viz., the rests; thus, marks are formed by the current, and rests are indicated by its absence. In the apparatus I first saw, Herr Föhr distinguished the sharps and flats—or to be more correct, the black keys of the pianoforte—by red stains, the white keys appearing with blue stains. He obtained this result by using styles of different metals, but though the plan certainly possessed a pictorial advantage, it presented certain disadvantages which induced him to prefer the employment of one colour only, distinguishing the stains

representing the white notes by making them twice as broad as those standing for the black notes. Thus,  indicates a white key-note, and  a black one. There is no great difficulty in translating this species of musical shorthand; with a little patience and intelligence it can readily be done, either by the composer or his amanuensis. I suggested to the inventor a method of marking the bar-lines, which has been adopted in the instrument before you. It consists of a pedal in electric connection with two platinum styles placed at the extreme top and bottom of the stave. On depressing this with the foot, as in the ordinary mode of beating time, the place of the first (or indeed any) beat of the bar is indicated by lines stained at the moment of depression on both sides of the stave.

It will thus be perceived that Herr Föhr's apparatus is very simple in design. There are no magnets or delicate mechanism employed; it is worked upon much the same plan as that of the electro-chemical telegraphs of Bain, Gintl, Bakewell, Casselli and Bonelli. The apparatus comes under the denomination of one of those time and labour saving mechanical arrangements, of which we have so many examples in this busy age. I cannot but think that it will take rank as an unerring and economical means of aiding our music composers, either when extemporising, or on playing over any previously thought-out piece.

*Note.*—Since the above paper was read, I have been informed that Herr Föhr's apparatus has, to a considerable extent, been anticipated by another inventor. In 1870, M. Alexandre Amédée Rossignol obtained provisional protection for an "Apparatus for tracing music," the complete patent being sealed in October, 1872. The invention consisted of an arrangement by which, on a band of chemically saturated paper, stains corresponding to the length of the notes played were made by an electric current passed through the moving paper. By means of using some styles or points made of iron, and some of brass, two colours were obtained—viz., red and blue, severally representing the black and white keys of the instrument. The inventor marked the position of the bar lines by providing that the performer's foot should beat time on a pedal, and so causing the electric current to stain indicating dots on the music stave. There was a bell attached to this apparatus giving notice if anything went wrong. I am not aware whether one of these machines has been made. Though rather more complicated than that of Föhr's, its principle is certainly the same. As it is stated that Herr Föhr conceived the design of his apparatus several years ago, since which he has been working it out, the question as to priority of invention is uncertain.