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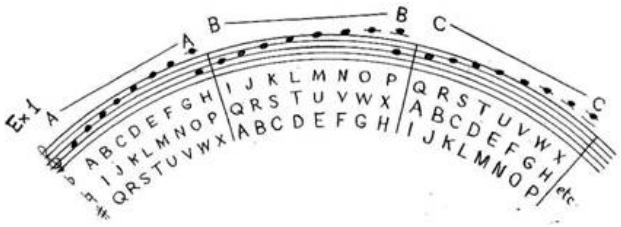
The Schumann Ciphers

The Musical Times, May 1966 (pp. 392-399)

Mit einem Seufzer fahr ich fort –
keiner andren Kritik wird das
Beweisen so schwer, als der
musikalischen
Robert Schumann



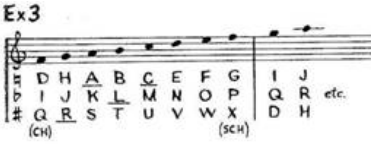
In an earlier article (MT, Aug 1965) I suggested that behind Schumann's music lay a system of substitution cipher. In more detail, the theory is that the young Schumann read a book an cryptography from which he derived a musical cipher-wheel, thus:

See Ex 1 above; pre-Clara cipher, c1827-c1834

The A-H line was later amended lo unite Schumann's names "F" and "E" (Florestan and Eusebius) with that of Clara (Clara Wieck, later Schumann), thus:

Each system follows the book in using conventions (eg Q for CH, X for SCH) and abbreviations (eg one symbol for ich *or even* dich*, which-in Clara-cipher happen to occur in the same column).*

One way of enciphering was to read all the letters in a given row as flat, all those in another as natural, all those in the last as sharp. Then successive turns of the cipher-wheel would yield 42 settings, ie any of the six possible arrangements of accidentals in any of the seven possible white-note scales. To take one *example; in Clara cipher on F with D-G, q; I-P, b; Q-X, #; thus*



her own name would yield:

Another way would be lo allot an accidental lo each column *instead of each row. A third would be to take the white-note equivalent and inflect it ad libitum. The many possibilities may seem daunting; but it is worth noting that however the systems are used they can never break free from thee general description of a sliding while-note scale with each note encipherable as flat, sharp or natural.*

Much more variable are the possible ways of using the cipher-yield. Thus, it may be a melody, whether in the given form (as Ex 4 above) or inverted or retrograde or both, al any pitch, in any octave, in any notation. It may have some or all of its notes repeated, just as in the well-known ASCH *and* BACH *ciphers. Conversely, if two consecutive letters should happen lo yield the same pitch then they may coalesce as one note. Some or all of the cipher-yield may be treated as harmony, with encipherments written upwards in the slave,* ie *from left lo right like words, and then sounded simultaneously as music.*

As a last example, the enciphered notes may be spaced out laterally or vertically within a preconceived framework and then treated as structurally significant, cg accented, notes within a total composition.

These are just some of the ways in which Schumann, on this theory, used his cipher systems. No doubt there were may others. But the purpose would always be the same as in his known use of cipher, namely a device of musical composition. Il follows that the governing concepts are musical, so there are no cipher "rules", It may be possible for a musician lo tell whether cipher is used, but that is a very different matter. Similarly, the cipher was never meant to be read, so there are no cipher "messages". Il may be possible for a cryptanalyst lo tell what texts were used, but that again is a very different matter.

Such a thesis may seem unconvincing, or unrewarding. What follows seeks lo show that it is neither. To keep the musical interest paramount, the technical evidence has been abridged. So far as possible the argument relies on textual reference lo Schumann himself, acknowledged authorities, or other relevant sources, as listed on page 400. As before, readers are invited lo test and judge for themselves.

All authorities agree that Schumann's mind and his music are one. He loved "veiled allusions, symbolism and mystery ... and his musical thinking is no less fantastic or subtle." [4] On his own testimony, "some extra-musical stimulus was nearly always necessary to start his musical imagination working at all", [4] though he "very often preferred to keep the sources secret"; [4] "the public were not allowed to know". [10] Clues to these stimuli left in first editions were regularly suppressed in later ones.

The stimuli were *always verbal.* Often it was a cipher-beginning with Op 1, the "Abegg" variations, in which those letters "translated into sound gave him the starting-point which his untrained musical mind, lacking the ability of thinking in sound without concepts, found indispensable". [4] Clearly a composer who finds *letters indispensable is* no ordinary composer.

Nor was it just Op 1. Schumann openly used cipher all his life. Nor was it just the so-called "musical" letters, but initials, homophones, anagrams and other devices, in articles and correspondence as well as in music. In these ways he somehow contrives to encipher no fewer than ten out of the twelve possible semitones.

Nor was it just cipher. All forms of semantic symbolism fascinated him from boyhood. He was interested in graphology; at 17 he writes about the decipherment of hieroglyphs; one of his earliest ideas was a musical language of flowers; a letter to Clara Wieck appears to be in code; *Liebeslied* op 51 no 5 has for sole text a code message; the last letter to Joachim refers to messages invisible ink between the lines; and so on.

Next, code-names. Schumann is known to have been obsessed by names and their symbolism. (Almost all the known cipher is of names). A diary page is covered with different signatures; the critical writings and letters contain not only puns but elaborate charades on names. Ingenious and puzzling sobriquets were lavished on friends, enemies, *Neue Zeitschrift* contributors, even days of the calendar. The town of Leipzig had two covernames; Clara had half-a-dozen, including the so far unexplained "Beda". Finally Schumann's own Florestan, Eusebius and Meister Raro have become so familiar that their fantastic aspect is overlooked. They might perhaps correspond to the Freudian *ego, id* and *censor,* though that would be bizarre enough; but what on any theory are we to make of the fact that Schumann had *over thirty* different ways of referring to himself?

The code names, like the cipher names, begin with Op 1 and the legendary Countess Pauline von Abegg. There were reasons for this mystery, according to Schumann, but he never revealed them. The countess was later unmasked as plain Meta Abegg (and perhaps fancy Abegg-Tema?)

She was said to have been a dancing partner at a ball-the masked ball, like the veiled allusion, or Sphinx, being another typically Schumannian obsession. Thus the *Papillons op 2* are so-called because they emerged from *Larven* (also = masks in German), the pun and the French word being further forms of disguise. Here and in many another work Schumann follows Jean-Paul in making the dance a dual symbol of society and of the individual; for him both were introvert almost to vanishing-point. He had secrets confided only Io the diaries which he kept all his life. Individual secrets together founded a secret society, the Davidsbund, of which he was not only the founder but the entire membership. For Schumann, everything was in a name; and his own was legion.

His prose writings are fragmented and mysterious in just the same way. They contain every kind of personal hint, reference and allusion; in a word, every meaning except perhaps the plain meaning of words. Few German prose styles are more opaque and ambiguous than Ms. As for poetry, his treatment of it in the songs, his own attempts at it, are all eloquent of verbal disorientation. Ali that is impressive about Schumann's use of words is contained between the lines. One might hesitate lo claim the same of the music. There, unassimilated concepts festoon the page, not just as titles or directions - though these are novel and profuse enough- but as extraneous ideas; initials, mottoes, quotations, comments, even essays.

Finally the music itself is used linguistically; the word is not only genesis but revelations. Thus the finale of the *Etudes Symphoniques* quotes a Marschner opera-tune, which signifies neither that tune nor yet its words ("Rejoice, proud England") but a cryptic clue to the name of, "our own Sterndale Bennett". [9] Similarly the more obvious allusions, *eg* to the *Marseillaise* or *An die ferne Geliebte,* signify neither the music not the words but some personal and extra-musical interpretation of Schumann's own. The same will apply to his many other echoes of *eg* Bach, Haydn and Mendelssohn and the yet undocumented ones of *eg* Beethoven, Schubert, Chopin and even Giuseppe Giordani, in so far as they are deliberate allusions; not to mention the many cross-references within his own work, most of which remain unexplained.

Not the least extraordinary thing is that no complete record of these idiosyncrasies has ever been compiled. Others seem not to find them quite so fascinating as Schumann on the clearest evidence did for some 30 years. But even a summary shows. that all these different ideas have one thing in common, *the attempt to assimilate discursive thoughts and concepts (ie words) with expressive form and feeling (ie music).* His own intuitive genius perceives this from the first. "Song unites the highest, word and tone, the unarticulated human letter (*MenschenBuchstabe*), that is the actual distilled quintessence of the life of the spirit'"; [1] thus the 18-year-old. Or again, at 28*,* "Everything that happens in the world has its effect on me, politics, literature, people; in my own way I reflect on it all, and then I have to give vent to it through the outlet of music". [15]

However, these and other attempts to explain in words are typically and untranslatably obscure. The music tells us much more clearly what feelings are being articulated, and in what way. But it will not be understood without some idea of its original synthesis; the reaction, as Schumann himself suggests, of extra-musical ideas bubbling through a musical mind. True, verbal enigmas tend to be insoluble, in music at least, so the whole aesthetic surface fizzes and fumes with mystery and allusion. But some of the deeper meanings are, again on Schumann's own testimony, compounded with the music as part of its very substance.

One such meaning, he repeatedly asserts, is his lifelong devotion to his Clara. Commentators echo this. "[Op 16/17] are nothing else in substance than his yearning for her"; "[his music's] sole inspiration was Clara"; [4] and so on. As he himself put it in 1837 "I have but one thought to depict everywhere in *letters and chords* – CLARA"*.* [12] And in 1841 "My next symphony shall be called "Clara" and in it I shall depict her with flutes, oboes, and harps". [12]

These are arcane utterances; and it is really hardly surprising that there turn out to be secrets - in the music: Indeed, "doubtless there are a number that have not been discovered." [10] "One day I shall explain them to you" wrote Schumann; and, confidently, "my Clara will find out what is in them" [10] But "it is clear that his music meant more to him than it can ever mean to anyone else" [10] and in fact "Clara was baffled". [7] Since she was one of the world's great musicians, the secrets can hardly have been entirely musical. Of their essential nature there can however be no doubt; they were themes signifying Clara. "Your theme appears in all possible guises" [12] "Are you not the 'Ton' in the motto [of op. 17]?" [15] and so on. In Schumann, for whom a hint was outspoken, this was an explicit avowal.

So perhaps was his saying that the music has "you, in all possible poses" [17] and even "how sweetly you will smile when you find yourself again"; [12] or that "you and a thought of you play the maim part in it" [12] or that it emerges as "a cry from my deepest heart"; [1] "one single heartcry for you", [12] "a deep lament for you", [12] and so on. If so, no wonder that this love-leitmotif came, as Schumann has it, so "sprachvoll", or speakingly, from the heart. [15]

After the composer's own testimony, music that speaks can be put on the stand and examined.

There is no lack of interpreters. For example, Robert Schauffler finds in the three sonatas and the *Phantasie* "a musical tribute to Clara". "For many years", he says, "I had studied [these works] before coming to realize with astonishment that they are all bound together into a larger unity by the consistent use of a single germ- and source-motif". [14]

Ex 5

A theme on these notes is attributed by Schumann to Clara herself. Roger Fiske [7] is in general agreement that this theme does indeed signify Clara, and adds another such discovery of his own from the *Davidsbündlertänze op 6*

Ex 6

which is found in one of Clara's own works. Thirdly Erwin Bodky is said to have told his students in Berlin that the pattern C|B|A|G(#)|A was Schumann's Clara theme.

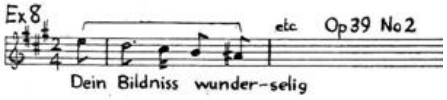
It will be pointed out that these are subjective, fragmentary and apparently contradictory impressions. Just so; how else would the truth about Schumann's music be perceived? Different voices may well harmonize, and harmonize well. Given that the first two themes were heard by their discoverers in various keys, [7,14] and that the first was heard inverted, the parts become all of a piece. Thus

Ex 7

This does not quite yield "all possible arrangements" *(Lagen und Stellungen)* [17] as stipulated. However all the missing inversions can be restored by completing the top half of the ring; which may be what Schumann had in mind in calling his music "full of wedding thoughts"; [12] it is certainly the work of a man in a trance of amorous fantasy.

But even this table as prepared from the evidence is unusually well-laden with further inference. Like Mendeleyev's, it seems to have missing elements with predictable properties. Thus form P is the opening theme of the "deep lament" Op 17, and the main theme of the Allegro of the "cry from the heart" Op 11. The analogous next step in any key might have been entrusted with a similar expression of yearning for absent love, as for example in the delectable "Intermezzo". There is much of you in these songs" [1] wrote Schumann to Clara.

Ex 8



Similarly the converse might have the meaning of reunion, as perhaps in the amorous *Davidsbündlertänze.* "They are dedicated to you more than anything else of mine" [12] wrote Schumann to Clara.

Ex 9

This is the music of reconciliation that we hear blandly contradicting the plain sense of Heine's words in *Am leuchtenden Sommermorgen* and again at the end of the marvellous *Dichterliebe,* essentially thus:

Ex 10

On this view the two meanings might converge at the theme's crossroads, X and Y of Ex 7.

Thus the latter occurs just as clearly in the songs of separation of the *Liederkreis* op 24 (also written "wholly in the thought of Clara") [12] as in the *Davidsbündlertänze.* [7] But the mysterious X is the closest link of all. Its forging resounds in the 1840 songs, especially in the wedding-present of *Myrtles* op 25, which according to Schumann afforded a closer insight into

the inner workings of his music. So it does indeed. Thus the Clara melody at Ex 4 above might serve to explain how the blissful opening of the *Lotosblume* actually strikes the same notes as the anguished close of *Und wüssten's die Blumen*:

And there are not just these two examples among the 1840 songs, but literally dozens. Nor does it occur just once in a song, but may be redoubled and repeated over and over. Further it not only occurs everywhere as promised, but means everything; the pangs of despised love in *Das ist ein Flöten und Geigen*, and the opposite, the joys of requited love in *Ich wandre nicht* (which though invariably dated 1841 can confidently be assigned to early 1840, just after the pair had decided not to elope to England "Nein, nach England gehen wir nicht, meine Clara"). [2] And perhaps we can guess what Schumann was dreaming of when he distorted Heine in order to linger over a certain melody; "to write music like this one must have a sweetheart like you": [12]

It was of the *Kreisleriana* that Schumann had prophesied that Clara would smile when she recognized herself in the music: [12] perhaps she did - in No 5? It was over Op 17 that Schumann wrote "through all [these] tones there sounds one tone softly for the secret listener". Perhaps this undersong can be overheard. "It is not easy to be sure" says J. Fuller Maitland, "which of the themes is the 'leiser Ton' of the motto", but I think it is this [9]

If so. then the phrase marked X might be speaking with characteristic clarity. "Are not you the 'Ton' in the motto?". It is heard again stated as well as hinted throughout the second and third movements.

On this view the symphony that was to be called Clara is the so-called No 4 in D minor. In every sense, Clara appears to be its sole theme:

The variants at D and I are of special interest. The thematic connection has often been pointed

out; Schumann indicated that a Clara-theme would be found inverted and retrograde; these virtual images would still mirror her faithfully – "They are exactly like my loved one", as he may have reflected when writing *Im Rhein*:

But it is the Clara theme in its best loved form that the symphony clearly embodies. Without counting variants or repeat marks or orchestral doublings it occurs scores and scores of times in this one symphony; in the others hardly at all. Further, the dating of Schumann's remark identifies this as the "Clara" symphony without any musical evidence of any kind-too clearly, he may have thought, since he withheld it from publication for ten years and then rescored it.

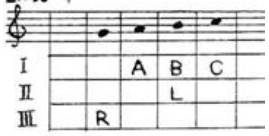
It seems reasonable enough to infer from both music and letters that X = Clara. This theme is a secret, a Sphinx. But it has distinguishing features exactly like Clara's own. Its first, third and fifth terms stand in the same relation as the letters in her name. Further, when the first note is C, the third and fifth are both A. Again, it is heard as expressive music, signifying Clara: C, B (*b*) A, G (#), A. It is part of the music and at the same time extramusical; it speaks her name and at the same time is her name. And Robert Schumann is the most famous musical encipherer of names in the whole of recorded history.

Perhaps the conclusion does not instantly follow. But it looks rather wistful, as if it would like to. Once open the door to it and it demands to be admitted; once entertain it and it not only remains but invites several others, which all seem equally at home. Perhaps it inheres in the premises?

*

Ex hypothesi, a discoverable system will be one of substitution cipher in which a sliding scale of x white notes is aligned with an alphabetical arrangement of y letters in z rows. Take only the four different notes of Ex 4 as heard in *Die Lotosblume* (Ex 11a). The letters A and C give those notes. B obviously completes each sequence. But the letter L also gives that note and therefore must come below the letter B, in a second row. Similarly R must come in a third row, and we have:

Ex 16



Now the scale used is prima facie that of the music itself, *ie* it begins on the note F. Hence the letter L is the fourth letter in its row which therefore begins with I. Therefore, because of the position of R, that row ends with P, and the third begins with Q and hence ends in X. So a flush of 16 consecutive letters has already driven into the open the three unknowns: x = 8 notes, y = 241etters, z = 3 rows.

There is no reason why any alphabetical arrangement should even be *possible,* let alone why this *particular* arrangement should emerge. Furthermore, it looks extraordinarily like a cipher-table. Experiment with laying different places at it for other names seemed to show that it is unlikely to have occurred by chance; and if it occurred by design, then that design was Schumann's. The resulting arrangement

Ex 17

—	—	A	B	C	—	—	—
I	J	K	L	M	N	O	P
Q	R	S	T	U	V	W	X

has five empty spaces, which can be filled from the seven missing letters in 2,520 different ways. Various arrangements, beginning with the obvious GHABCDEF, were tried on a selected passage of Schumann's music (the bewildering conclusion of Op 48 No 8) without result. Butthen, suddenly, one arrangement yielded a decryptment from that same passage. For the decipherer at least, on any rational application of the principle of difference, this fact admits of only one conclusion. However, "getting a correct solution is not a matter of the cryptanalyst thinking he has done the trick; it is not a question of opinion, but a question of proof." [8] Yet the standard tests seemed satisfied. Substitution cipher cannot easily be simulated. The presence of a cipher in Op 48 No 8 seemed to make excellent sense musically. The text itself (see Ex 11 of my previous article) was

later found to make excellent sense biographically. Some of the other plain texts were unexpected yet made excellent sense. Others were prima facie probable *(eg Hermann and Dorothea*on successive accented notes). Here probabilities can be calculated according to well-known principles. Independent calculations gave a probability of millions to one against their being a chance result.

Two further questions are suggested. First, what exactly was the method used? Second, what was the system used before Schumann met Clara Wieck? At first the evidence seemed to show that the process was in two stages; a letter was enciphered as a given white note of the scale, which then was inflected # or p, or left ♮; for musical reasons. The various versions of the Clara-theme showed that it could work in this way; and indeed the resulting flexibilityhad been taken as a point in favour of, as well as against, the theory. However, if the cipher was there as a permanent adjunct to composition, the flexibility was arguably too great; a flexible goad would be pointless, and a flexible crutch unreliable.

The known use of cipher provided the further clue needed. Asch, Abegg, Bach and the other composition-ciphers yield actual musical notes at definite *pitches.* Perhaps the newly-discovered cipher can do the same? Again Clara (Ex 4) is eager to confide the secret. The notes C and A in the *top* line are ♮, B in the *second* (=L) is *b*, and G (=R) in the *third* is #. This would have been the result in actual pitch if each line of letters have been allocated an accidental as part of the system, as shown in Ex 1 & 2, with each letter yielding an actual pitch defined by two musical coordinates.

The whole basis of the cipher theory had been that in Schumann if in any man the concept of music and letters was profoundly unified. Here is music and letters indeed: the terminals of two semantics touch, flash and fuse. Properly controlled the system can relay all manner of contacts between words and music, such as stringing together the successive letters of an encipherment as single accented notes throughout a musical framework, like illuminations at a féte. It seemed appropriate enough for Hermann and Dorothea of Goethe's drama to have their names in lights in this way. The obvious circuit for further testing would be the earliest music known to have been powered by the idea of Clara, namely, the F# minor sonata op 11, begun in 1833. At first sight the accents look interesting, *eg* in bars 20 and 52:

No doubt Schumann's accents are clearly justifiable on musical grounds. The question is whether they might have an extra-musical source as well.

Ordinary cryptological methods disclose one cipher-system (and one only) which would have the predicted effect of turning a meaningful text into the successive accented notes which begin this sonata. This is the scale on F (#), just as in Ex 3 above but with the top line of letters encipherable as *b*, the second as ♮, the last as #.

This system is far from flexible. Thus, the first accented note, A, can have only one source, namely the letter K, as the *unique* possibility among *twenty-four* letters. Despite the ambiguities inherent in the system, no note can *ever* have more than three possible sources out of *twenty-four;* while from the point of view of the composer, any sequence of letters determines instantly and unambiguously a sequence of actual notes.

It may be that the following sequence of letters determined the accented notes of Op 11:

that is to say: "Ill. Oh Clara, shall I win you?".

The enciphering continues in the same strain, though the key will be found to change in both senses. The surrounding music in the opening Allegro is a ceaseless reiteration of Robert

Schauffler's Clara-theme in its sad descending mode (P in Ex 7) together with the falling fifth which he also associates with the idea of "a private greeting to Clara". [14]

Once again the cryptological criteria seem to be satisfied. The mathematical probabilities are difficult to formulate with precision; but it can certainly be said that the chances of finding a rational text by pure coincidence on the system described are - as experiment will show - very slender indeed. The text itself, though at first sight surprising, turns out to have evidential value in its own right. Thus *krank* may seem an unlikely word to encipher. But in Schumann, the addict of musical mystery, "all his most individual music is completely introvert, pages from a secret autobiography or rather diary"; [10] "cryptic writing often appears in diaries"; [8] he was an obsessive diarist; and an actual (and typical) entry from the 1830s is "*Fürchterlich krank. Musik in mir.*" [1]

True, the text suggested involves one small discrepancy. Thus the letter B should strictly have been enciphered as B*b*. However, this would hardly be natural in F# minor; as explained, there are of course no rules; and in any event this would be well within the range of normal transcription error, let alone Schumann's, which was, as the words of the songs show, unreasonably high. Prima facie then here is the cipher being used for composition. The plan of interspersed accented notes may be an unusual musical principle, but it is a commonplace of cryptography. Even from the purely musical point of view there are certain facts that assort well with this device-for example Schumann's practice of leaving blank bars (at certain structural points) to be filled in later. His often remarked "mosaic" methods, his decorative gift, his "intellectual" approach, his obsessive rhythms, his melodic angularities, his whimsical use of accents, his subjective approach to song-writing, above all the sense of mystery diffused through the music; all these and more seem to gain in significance in the light of a cipher theory.

To emphasize one single aspect among many it is noteworthy how in the example above the word *krank* is confined to the doleful introduction, after which the subject is changed in both senses - the same correspondence with musical form as was noted in the Hermann and Dorothea example in the previous essay. Again in the same passage the enciphered *krank* is confined to the links between themes. It happens that "formal encipherment" [16] is a technical term; and perhaps with Schumann a term of art.

We return now to the second question: namely, what was the system used by Schumann before he met or heard of Clara Wieck? Retrograde analysis begins with Ex 17 above. It looks exactly like an alphabetical table disarranged to make a special place for Clara. In that case why not simply change the top line from ABCDEFGH to GHABCDEF? But the observed top line was DHABCEFG. The expected order has thus been varied at E and F. Now as we have seen, these letters are, in Schumann's mind at least, his own name. Given his obsession with name-symbolism, the reason for the change becomes clear; it is made in order to unite his name with that of Clara.

This hypothesis finds unforced confirmation at every turn. It lends colour to Riemann's suggested explanation of the pseudonym "Raro", namely CLA**RARO**BERT. There are indisputable facts as well. In 1833 Schumann wrote to thank Clara (then not quite 14) for the dedication of her Romanze op 3 : "I would hope that the union of our names on the title page might indicate a union of our names and ideas for the future." [12] In 1835 he writes that "the calendar unites your name with mine" ("Clara" and "Eusebius" were namedays in August). His first musical linking of these names was in Op 11 published as the joint work of "Florestan and Eusebius" (the sole clue to the composer's identity) and dedicated by them to Clara. This is the first of Schumann's works in which a Clara-theme was discerned (P of Ex 7 above). The second such conjunction appears in the later Op 6 (1837), in which the pieces are initialled "E" and/or "F" and which begins with a motto-theme by "C.W.". This is the second work in which a Clara-theme was heard (Y of Ex 7 above). Whence Erwin Bodky drew his theme X is not known; but certainly it can be heard in the 1840 songs, particularly Op 25. The linking of names by marriage is the obvious surface meaning of that work. There may well be hidden meanings too. For *Myrthen* has 26 numbers-or letters; of which No 5 or E, and 6 or F, are respectively Eusebius and Florestan to the life, (just as in *Carnaval),* while No 3, C for Clara, is the evergreen *Nussbaum.* Finally, if we encipher "F. E. Clara" as predicted, backwards as well as forwards, they become the theme already identified (Ex 7) as composed of all the Clara-themes ever discovered; and this joint theme too appears in one of her own works. This would help to account for the frequent and gleeful references in their letters to "Doppelgänger", "revenants" and the like, ideas of which the musico-verbal punning symbolism would identify Schumann, not Clara, as the source. In particular the codeletter already mentioned, of July 1834 15 not only ritually unites Florestan, Eusebius and Clara (not forgetting her Doppelgänger), but also contains an obvious example of music-cipher-which is worth a second look. [3]

It seems unlikely that Clara was able to read it; otherwise she would hardly have been displaced in Schumann's affections, even temporarily, by Ernestine von Fricken from Asch - who

must however have seemed destined by fate to bear his name, since in music and letters she already had it (E, F, S, C H, A): which may be why the *Carnaval* sphinxes "joined Schumann's name to Asch". [3]

Finally there is another retrograde analysis to be made from the original or pre-Clara form (Ex 1) of the cipher-table. First, one would expect to find this table used on the added-accidental plan already described *(eg* Ex 3*).* This seems to be so. A second inference; if the Clara-melody was after all an *effect* of the cipher and not vice versa, one would expect the early music to contain this theme only occasionally and non-thematically, in a way wholly distinct from the innumerable thematic uses in post-Clara music. This is the case.

A final inference; it is clear that the original cipher table itself, Ex 1 above, is also an *effect* rather than a cause.

One obvious answer to the question "what is the best way to make a composition cipher?" would be: allot the 26 letters at random, or with a Playfair-type key word, among 13 semitones on a chromatic sliding scale, *eg*

Such an arrangement does everything that Schumann's cipher can do, and does it rather better. Furthermore, it is infinitely clearer and, with careful use, unbreakable; it can safely be recommended to all composers not already using it. But if an acceptable degree of flexibility is obtained by a chromatic arrangement of 2x13=26, why in the world should anyone opt for a diatonic system of 3x8=26-2=24, with an elaborate and inconvenient chromatic system built in to correct a flexibility which need never have been introduced in the first place ? And even allowing, per impossible, such a general system, what could possibly account for the extraordinary features of a special key which involved (among many other curious points) omitting the not uncommon z and including the very uncommon q and x which are then, to cap it all, used in place of the very common digraph *ch* and trigraph *sch* respectively? Again, there is technical evidence that the system involved a musical cipher-wheel with three alphabets; where could ideas so bizarre have come from?

These questions, though puzzling, were not beyond conjecture. The cipher system was a proposition so highly detailed and complex that it must be "the answer not to a vague and generalized question but to a question as detailed and particularized as itself". [5] In other words, it derived from some detailed source of cipher description; and the only likely source was a contemporary book on cryptography. Schumann's father was after all a bookseller and publisher "supplementing his school reading with books from the bookshop such as were not likely to find their way into the schoolroom". [4]

It is still abundantly true that the layman cannot approach the problems of keyed substitution cipher with variants on a wheel system without the help of a book. As often happens the need to resolve this practical problem helped with the others as well. The best and handiest manual of our own day leads us straight back to what was no doubt the best and handiest of Schumann's. Laurence Smith's admirable primer *Cryptography* [16] explains cipher wheels. Better still, its bibliography contains (as the only recommendable book written before 1914!) Johann Klüber's *Kryptographik*, [11] published by Cotta in Tübingen in 1809. This rings a whole carillon of coincidence.

This book would have been a major item in Cotta's list from 1809 onwards. Klüber (1762-1837) was an international expert in civil and state rights and affairs; hence his connection with Cotta; hence his successful appointment as Hardenberg's aide at the Congress of Vienna; hence too his expertise in cryptography, which was in any event of topical interest at the time of the Napoleonic Wars. When *Kryptographik* was published he was professor of law (later Schumann's subject) at Heidelberg (later Schumann's university) where he was succeeded by the eminent jurist and amateur musician Thibaut (later Schumann's teacher and mentor). And it was ostensibly "to bear the most famous professors of law" [2] that Schurnann changed from Leipzig to Heidelberg.

Now, when Schumann's father set up in business in Zwickau in 1807, Cotta had just started to bring out a journal, the *Morgenblatt.* It has been shown that a current copy of this was in Schumann's hands in 1827. Again, certain poems by Justinus Kerner, first published by Cotta in 1826, were set by Schumann two years later. Further, it is highly probable that Cotta had business connections with Schumann's father, as he was a regular visitor to the Leipzig book markets. The reasonable presumption is that these connections were of long standing, and it will appear later that there is some confirmation of this. But even without further evidence it would still seem likely that a copy of Klüber's book went to Zwickau; and there came into the hands of the young Schumann, whose interest in cryptography was to be immense and enduring.

In any event the facts surely speak for themselves. How could a previously unknown and unheard-of cipher manual be found to have unique and detailed correspondences with Schumann's letters, diaries and critical writings-unless he had read it? And how could that same manual be found to have unique and detailed correspondences with a cipher system inferred from his music-unless he had used it?

Here are some of the main cipher correspondences: a music substitution cipher (called "musique parlante" in Klüber!); a cipher wheel; an alphabet of 24 letters; a three-line alphabetical system; added - sharps and flats; sharps with the special meaning of "the opposite"; a system of co-ordinates; frequent changes of cipher setting; dummy letters or blanks; R for ER; F for PH; one symbol for *ich;* equating U with V; omitting A after H; omitting Y and Z altogether; N for NN; S for SS; and the truly extraordinary devices of putting Q for CH and X for SCH. All these and other points are either described in terms by, or clearly inferable from, Klüber's book. Here are some non-cipher correspondences.

Schumann wrote to a boyhood friend in 1827: "I'm writing you hieroglyphs; I shall hardly be able to decipher them even to you, you who know every crevice of my heart." [15] Klüber has three sections on the difficulty of deciphering hieroglyphs.

Schumann wrote *c*1828 that one of his earliest ideas was "a musical language of flowers". [3] Klüber, in the section following the three on hieroglyphs, describes the language of flowers.

Schumann's wedding present to Clara in 1840 was, as we have seen, a song-cycle called *Myrtles.* Klüber in the same section says that a gift of myrtles means "I love you and want to marry you". The letter of 1834 already mentioned is couched in a style so bizarre even for Schumann that it strongly suggests the use of code (Clara suspected that their correspondence was being intercepted). It was written in response to her mysterious request for an obscure reply ("undeutlich" - difficult to read). [12] It contains a postscript with a list of words said by Schumann to be illegibly written in the body of the letter. Klüber describes a code system of writing out a message, inserting its words at given intervals into a letter, and conveying the numerical key by means of an ostensibly innocent postscript. Both the letters mentioned above suggest the use of such a method; and if so the actual encoded text should be well within the grasp of a German cryptographer working on the original manuscripts. [3] It is perhaps worth adding that the principle involved in this code system (known as Heidel's method) is exactly that of enciphering letters as notes of music and then weaving the results into a composition.

Again, with the help of Klüber the mysterious Beda can now at last be accounted for. "At the beginning of 1837 Schumann seems to have been resigned to the loss of Clara". [10] At her father's insistence she had broken with him "and even showed some leaning towards Carl Banck… who replaced Schumann as her mentor in composition". [10] "On 19th May Schumann published in his paper an article in which Banck himself was ridiculed as "de Knapp" and Clara as "Ambrosia", the still-loved aspect of Clara being personified as "Beda". [10] Schumann is so pleased with this name for Clara that he treats it to one of his name-encipherments, thus:

And Beda, it is made clear, is a pianist; one who by the visionary sweetness of her playing (of Chopin's *Bolero)* is able lo create and display to her listeners a picture of her lover; to borrow Schumann's own ideas. But are they his own? Klüber, in his chapter on sign-language, says this :

> The Romans spoke of eloquent hands, manus loquaces. Thir mimic art had reached a stage of development that we can hardly conceive. The Venerable Bede *(Beda, Venerabilis)* wrote in the 8th Century a treatise *De loquela per gestum digitorum.* Finger-talk and hand-language, properly developed and taught, could serve as a universal language.

The idea of a universal language expressed through the hands and fingers has a double appeal, to musician and pianist; "Beda" in both senses was one of its most distinguished exponents.

Then there is the tragic letter to Joachim of 1854 already mentioned in which the brain-sick Schumann apologizes for not having written earlier and adds: "But I have often written to you with sympathetic ink, and between the lines of this letter there is secret writing which will emerge later". [6] Klüber has a chapter on how to write secret messages which appear later in between the lines of a letter; - by the use of "so-called sympathetic ink" [*sic*]. [11]

There is much more to be brought to light. Thus an early notebook of Schumann's contains a page of seemingly casual figuring which answers lo formulae found in Klüber. Further evidence will no doubt be forthcoming to show that the young Schumann read and profited from this book. If so, he would have been especially taken by the description of the cipher-wheel "which will

enable everyone to make a similar device for himself". [11] It may be that the information contained in this essay will enable others to do the same in turn.

This brings the wheel nearly full circle; but there is one last twist.

Schumann's lifelong favourite of favourites was Jean Paul's *Die Flegeljahre. This* fantasy contains the contrasting characters Vult and Walt Harnisch, from which Schumann evolved the idea (and the alphabetical relationship?) of the code-names Eusebius and Florestan, the tragic-comic masks of manic depression. It contains a scene [13] in which Walt Harnisch breaks three piano strings while tuning a piano - a, c, and h (= b in German), which are said to be letters from his name; and other references are made to "musical" words such as "Bach" and "ach". Here surely is the first source of the Asch ciphers of *Carnaval,* "also the letters in my own name" [15] (though it took Schumann to see that S=Es =Eb) not to mention his own later "Bach" and "ach" ciphering.

Finally, it contains the fancy dress ball [13] or *Larventanz* from which Schumann incubated his *Papillons* and-many another colourful musical symbol. This work also was published by Cotta in Tübingen at about the same time (1805) as Klüber's *Kryptographik.* If these two books also coincided in Schumann's reading, then that would be the most significant coincidence of all. For Jean Paul and Klüber - confessions and secrets, emotion and intellect, dream and cipher, music and letters - are, in a word, Schumann ... and the whole egregious fantasy of E and F, the only two scales that can be contained in the treble stave written round a wheel.

So we have turned and returned from the music back to the music, from Schumann back to Schumann, by way of tables, and books; by way too of masks and magic; a fitting epitome of one who was of all composers at once the most inward and the most wayward.

Notes

[1] Bötticher W., *R. S. in Persönlichkeit u. Werk* (1941), 315; 206; 352; 160; 315
[2] ---- R. S. nach Briefen u. Schriften (1942), 318; 17
[3] Boucourechliev, A., *R. S.*, German trans. Möhring (1958), 63 & back cover; English trans. Boyars (1959), 66, 82 & 123
[4] Chissell, J. *Schumann*. (1956), 88; 46-7; 91; 19; 47; 6-7
[5] Collingwood, R., *An Autobiography* (1945), 26
[6] Dahms, W., *Schumann*. (1916), 215
[7] Fiske, R., "A S. mystery" in MT Agosto 1964, 575-7
[8] Friedman, W. & E., *The Shakespearean ciphers examined* (1957), 21; 16
[9] Fuller-Maitland, J., *S.'s piano works* (1927)
[10] Grove (1954), *R.S.*, 608, 609, 623
[11] Klüber, Johann, *Kryptographik* (1809) *passim*, esp pp, 60-77, 106-284, 386-450; Table II; Beda 235
[12] Litzmann, B., *Clara S.* (1902-8), chaps. 2-8 *passim*
[13] Richter, J. (Jean-Paul), *Flegeljahre* (1805), cap. 63, 20
[14] Schauffler, R., *Florestan* (1945), 297; 285
[15] Schumann, Clara, ed., *R. S.'s Jugendbriefe* (1886), *passim*; code letter 245-9
[16] Smith, L., *Cryptography* (1955), 158; 61; 156
[17] Wörner, K., *R.S.* (1949), 118

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