

AN EXACT NOTATION

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SINCE the days of the neumes, the development of our system of notation has gone on slowly and gradually. What is not generally realised is that it is still in process of evolution. But for the last five hundred years or so, the professional musician has been so directly and increasingly concerned with notation, that he has come to regard its present limiting influences as fundamental and unavoidable. Therefore he writes only that which he knows can be understood and played or sung by interpreters who have to accept the same limitations and conventions.

But the folk musician has remained in that happy state of ignorant freedom as were all musicians, professional or popular, in the days before the beginnings of notation. Consequently he still has the awkward habit of singing or playing sound arrangements which do not fit into our (notational) way of thinking.

Anyone who has tried to collect folk songs will have realised this. For a time it seemed that phonograph recording had solved the problem to some extent. But the peculiar features which make folk music so attractive are almost as difficult to isolate coming from a phonograph as they are from a singer's throat or from the sound board of a fiddle. They are too subtle and pass away much too quickly to give the listener a chance to grasp what they really are. And if he does somehow manage to do this, there is still no means at his disposal for recording what he has discovered.

Messrs. Milton Metfessel and Carl E. Seashore, of the State University of Iowa, have written a book called *Phonophotography in Folk Music* (published by the University of North Carolina Press), in which they show how they have captured these intangible elements by scientific means. They have further reduced them to a notational system on the printed page, so that

they can be studied at any speed to which the brain can adjust itself. They have actually devised a means for registering sound effects, musical or otherwise, in which every subtlety and irregularity is recorded. And they have invented a notational scheme for their purposes which is exact in all respects. Every irregularity is registered and exactly recorded. It is the first time this has happened in the history of music.

What they say about their recording instrument can be summarized as follows: "The apparatus consists of photographic instruments mounted within a suitcase. In the interior there is a large wheel to which a crank is attached from the outside. Motion picture film is wound around the wheel, coming from a film magazine. In its passage from the magazine to the wheel, beams of light are concentrated upon it. These lights are reflected from tiny mirrors which are attached to diaphragms. . . The sound wave photograph is made on the moving picture film by three light points. The diaphragms pick up the vibrations of sound, and the mirrors translate the vibrations into an up and down flashing of the light. The light flashes at the same rate at which the vocal cords are sounding. . . ."

What results from this is a photograph of the sound waves exactly as they come from the singer's throat. The exact data thus at hand is plotted on a graph, with time as the horizontal and pitch as the vertical coordinate. In effect, it is a continuous line, (except of course for actual breaks in the continuity of the sound), which rises and falls, whoops, clucks, wobbles and trembles exactly as the human voice does.

Above this lively curve is superimposed a series of thirteen lines corresponding more or less to the scheme used in our modern staff notation. The interval from line to line is an exact semitone in the even tempered scale, so that this staff expresses between its extremes an octave interval. The lines representing the notes of the major scale are continuous, but those for the semitones in between are dotted.

These thirteen horizontals are crossed by verticals which do not correspond to bars or beats, but simply express the passage of a second of time. The horizontal lines for the semitones are dotted, as described above, but each dash in the broken line is

of constant length and represents the passage of one tenth of a second, so that between the vertical "bars" representing a second, are ten dashes each representing one tenth of a second.

Across this arrangement of horizontals and verticals, exactly coordinated for pitch and time respectively, the vocal line, as expressed by a true graph of the actual sound waves, sprawls and reels.

By this means, all those features which go to make up the "human" element, in "expressive," "emotional" or "artistic" singing (or playing, for that matter), can be isolated by reference to the staff notation standard behind, and the different ways in which each type deviates from it. These deviations, although quite considerable, are by no means entirely capricious, and it has been possible for Mr. Metfessel to analyze and classify them somewhat. In this, however he has confined himself almost entirely to a study of the vibrato, tricks of the voice in the attack and release of a tone, and questions involving aberrations in pitch in general. But the rhythmical variations from the regular beat and measure are just as fascinating and important, and can be estimated exactly by referring them to his one-second vertical lines and his tenth-of-a-second dashes. A study of this would undoubtedly throw some light on the principles which are behind the syncopations and subtle rhythmical innuendoes in negro singing. These cannot even be suggested by staff notation.

As it is, negro singers have been used in these experiments almost entirely, and the examples are divided into the following classes: workaday religious songs, spirituals, work-songs and blues. There are a few side shows, such as that of a college girl singing *Lover Come Back to Me*, records of a negro laugh and the *Cornfield Holler*. In all these, if less noticeably in the spirituals (which have definitely been influenced by notation and the concert room), the new method shows a variation from the staff which is almost unbelievable.

Between the notes there is a rapid "portamento" usually lasting anything from a tenth to a fifth of a second. Notes are not strictly in tune, and if they are hit squarely, they are not held regularly. In some cases the rapid "portamento" between notes is taken beyond the new one and then hitched back again on to

it. An "obscene song" notated is a miracle of capriciousness. There are breaks and halts at the queerest places in the rhythm of the tune, while sounds are made in between, too rapid and fleeting to be called notes. There are other peculiarities too numerous and subtle to be described without the notation to refer to.

Although the inventors of this new method have the scientist's casual attitude towards esthetic effects, and are apt to say the most irritating and inept things in all seriousness and ponderousness, it will be admitted by all fair-minded persons that they are making a very bold and determined attack on certain elements in musical expression which have defeated and always will defeat the purely psychological or personal approach. For them, quite naively, "the vibrato is a mode of expressing the tender emotion." But at the same time, they are able to say that they have "found the basis for a scientific terminology descriptive of musical performance, which is now greatly needed to clear away the rubbish of current musical, literary and even anthropological descriptions of music in terms of undefined concepts." This is a hard saying but true enough. And if all the current description in terms of these undefined concepts were prohibited, ninety percent of our musical critics would have to pack up and get out. But if the modern musician's professed revulsion from the romantic point of view of the last century is really sincere, this should be good news for him. . . .

These two scientists have shown that it is possible to isolate, describe and classify all types of variants from the cold non-emotional mechanical production of tones to the "most highly artistic expression of esthetic emotion." They have proved that in musical performances, pure tone, true pitch, exact intonation, perfect harmony, rigid rhythm, even touch, precise time, and all the professed ideals of the academy and music teacher play a relatively unimportant role. These are mainly "points of orientation for art and nature." They have shown that this deviation from the exact is the means for expressing esthetic emotion and that singers in particular express themselves by means of an "emotional flirtation" with rigid chaperonage of the staff notational system.

Most people have felt that this somehow was so. Here it is definitely proved. What is more, the actual gestures which make up the flirtation have been isolated. Where are the musicians who will follow them up and help them in this? We are all keen enough, apparently, since Stravinsky led the way, to get the fundamentals of musical expression under control and put in their proper place. We do not want our emotions to lead us by the nose. Here is a means for watching ourselves in a mirror and studying our actual behaviour in the light of our new theories of esthetic integrity. But musicians are much too lazy and much too keen on large hand-waving gestures to get down to a study of what they really are about. Unless we sit up and take notice, in a short time we will be exposed and convicted out of the mouths of these new scientific babes and sucklings.