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The Acoustic Stereoscope

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THE ACOUSTIC STEREOSCOPE

About two generations ago, there was a gadget considered sensational by children, and not only by children. Today, it is almost forgotten, unknown to the younger ones, for, compared to a primitive five-and-ten-cent kitchen gadget in the most remote American village, it is hardly more than a fossil: we are speaking of the "stereoscope."

To refresh the memory, by taking into account the slightly different angles of the two eyes, the two different pictures offered by the stereoscope were able to deceive us. The two became one; blended together, they assumed the semblance of "depth." We, or rather our grandfathers, had the "Ersatz" of seeing Naples or Calcutta in the flesh: not only their "pictures."

The acoustic device that we are going to suggest is the twin-brother of this stereoscope.

As we know, it is not only the optical world that is spatially structured; the acoustic world has certain space-characteristics, too. True, its "space" is far less articulated than the optical one; the idea of a "geometry for the ears" is absurd; identifications of "points in space" by hearing is impossible; at best, we seem to find out the direction of sounds or their vague distance-character; never, however, their "locus." While the seen object "is where it is," the sound seems to expand, to bridge or fill the space, to be "omnipresent," to be "here *and* there": here where it is being heard; there where it originates.

Yet what about those phenomenological characters as "filling the space" or "omnipresence"? Are they not concerned with "space," too?

To understand the "acoustic space" we would have to analyze it on its own merits. By attempting to discover the tactile and visual space-characteristics in the acoustic world, we would miss its specific properties. Our language contains words which, at least as indications, ought not be distrusted. They plainly show that there is no abstract or empty acoustic space within which space-objects exist, but only spatial acoustic objects or "events" which, in themselves, have space-properties or—structures. We distinguish the *voluminosités* of sound-complexes; their different "*massivities*"; the "*density*" or "*porosity*" of musical texture; we call one tone *higher* than the other; voices of an orchestral piece seem to be "*in front*" while others are supposed to operate as "*background*"; there is a "*continuum*" between tones, even different types of continua—the chromatic scale and the legato; there are "*jumps*" from one tone to the other which do not "*touch*" the in-between-tones, (f.i. the "*sext*") and so on.

Now, the space-character that, in connection with the "acoustic stereoscope," interests us most, is "*voluminosity*." There are musical pieces which, by making claim to, so to speak, "*limitless voluminosity*," wish to give the appearance of "filling the whole world." Wherever Romantics or Post-Romantics have tried to translate music into language, they have spoken about this space-experience. E.T. Hoffmann's panegyric words about Beethoven, Heine's description of Berlioz, Wagner's self-interpretations—these all seem to agree on this point: the limitless space of music which they describe in pseudo-cosmological or -religious terms.

It goes without saying that those descriptions apply only to nineteenth century music, to the epoch between Weber and Mahler. However, this music covers about fifty per cent. of our concert programs, even a higher percentage of our musical radio programs. Whoever listens to this kind of music, is not supposed to hear the musical pieces as being at this or that distinct point, but rather to feel "surrounded" by them, to be "*in music*," to be drowned by them. If, for his great Mass, Berlioz divided and subdivided orchestra and choir, if he demanded them placed in different corners of the hall (a church), he did it because he hoped to succeed in "cornering" and "overwhelming" the listener by this means more completely than with a sound-body whose definite "locus" would still have left a way of escape to the listener.

After these rough phenomenological and musical considerations let us open the faucet of the radio, to listen to one of those pieces of nineteenth century music. Do we receive their "space"?

Of course, the most primitive space-characteristics (as the differences between "higher" and "lower" tones) are conveyed without any change. In a way, also the impression of "massivity" seems to be transmitted by the radio. Yet only in a way—the original is being played in a huge hall that corresponds to the voluminosity of the symphonic piece; however, its broad stream is being channeled through the narrow pipe of the radio into our small drawing room to flow from a very tiny sound-source: a giant creeps out of a key-hole. Is it really the limitless and drowning space that we "receive"? Yes and no.

Yes—for, as we already indicated, the *quality* of massivity is undeniable; the difference between the "thinness" of a Bach invention played on a cembalo and the thickness of an orchestral colossus is not lost by the transmission. Listening in a tiny radio booth we may even distinguish the floating echo effects of music in a huge hall—a rather painful sense paradox; for now we seem to be in two different places, two different sorts of places simultaneously; and the two spaces seem to fight each other. It even may happen that three different spaces start contending for our ears: Suppose, a Mozart symphony is being played in a huge hall, in too

huge a hall, whose dimensions and acoustic conditions contradict the inherent space qualities of Mozart's music. There is the first space paradox, originating with the performance itself. Now, this "paradox" is being transmitted by radio to our listening post, our drawing room, which is neither congruent with the inherent "Mozart-space" nor with the sound effects of the huge concert hall. The distortion is doubled. We are far from hearing what we are supposed to hear. This example, however, represents an extreme case. Let us turn back to the simpler question. Does the radio transmission of, let us say, a Bruckner or Mahler symphony convey their actual "voluminosity"?

It does not. If the category of "*image*" may be used in the acoustic province (and we have to be cautious, for "*image*" seems to be an exclusively optical category), we may formulate the following: It is not the voluminosity itself that we are receiving, but the "*image*" of *voluminosity*. Its "space" corresponds in a way to that experienced in front of a photo of a landscape or a church interior: although we recognize it as perspectively "three-dimensional," as showing "depth," we can plainly see that the photo is depthless, that it does not actually pierce the wall.

Now, it is no accident that not only our eyes are *one* (dual) organ, but our ears, too. And it seems quite plausible that the space-effects of music depend on our having two ears very much the same way as the optical space-effects depend on our having two eyes.

A very simple experiment corroborates this assumption—and now at last we reach the *acoustic stereoscope*. To be frank, it is not even a new device that we compare with this simple optical instrument, but rather a primitive arrangement, a trick.

If you place one radio to your right and one to your left, and have them play the same music simultaneously, it immediately will assume a completely new "look."

The difference does not result solely from the fact that the two radio sets are two different instruments, each having a color of its own, for the new "look" does not consist only of increased colorism.

Nor is the new effect caused by the fact that the two apparatuses, playing together, are "stronger," or even twice as loud; for this "fact" is mere illusion. In "arithmetics of sound" one plus one does not equal two, which odd phenomenon is known to every acute conductor. When Mendelssohn wrote¹ on a choir of 2000 singers: "What it sounds like? It does not hurt any more than any other choir (a never ceasing puzzle for the people). . . just as thirty violins do not sound stronger than ten," he was perfectly right. No, the qualitative difference is caused by the stereoscopic effect.

¹ Letter, June 27, 1846.

When the two radios flank you, the two music-images become *one*; their merging produces the effect of *spatial* fullness; now you are actually *in* music. The difference between the "old" and the "new" look is far more than a quantitative or coloristic one; it is rather the difference that exists between a painting and a work of sculpture; or between just seeing a river from outside and being carried by it.

Now, it is surprising to observe that the feeling of "being *in*" is not the only space-effect produced by the two-set arrangement; all the other spatial characteristics of music assume a bafflingly articulated profile, too. Ordinarily, radio transmissions irritate us by gluing together individual voices of the orchestra; often they produce the effect of being strung together to form *one* single "sound-cable." This distortion immediately ceases when you hear through the "stereoscope." After a certain while you will even fall prey to the strange illusion that *certain instruments are being played in* (or even by) *apparatus A*, while *others* "obviously" emanate from *apparatus B*.

This illusion is most striking when you listen to a "concerto" which is supposed to convey the "spatial" impression of "confrontation" (of a soloist confronted by the orchestra, e.g., Beethoven, piano-concerto in g, 2nd movement). Now the soloist is not only heard as playing "in front of" the (background-) orchestra, but *one of the radios seems to become the soloist, while the other just accompanies*. In short, while the individual set does not convey more than the depthless, image-like "draft" or "check" on music, the two-radio arrangement provides us with the music itself including all its inherent space-attributes.²

² Another trick is almost as striking although it is even more primitive than our two-set arrangement. Again the effect can be produced for the ears as well as for the eyes. When you walk through a street with one eye firmly closed, you will not have the impression of a flat image of the world, although the *one* picture perceived by the *one* eye does not enjoy the opportunity of merging with a second one and thus gaining "depth." We are, however, so deeply accustomed to, or rather prepared for, living and moving in three-dimensional space that it requires a rather difficult effort *not* to see our world as three-dimensional: as a matter of fact, an actual act of abstraction is required to see the world as a mural-like plane. *Only if and when two identical images are presented to the two eyes* (as with photos, moving pictures, etc.) does the impression of flatness arise. Paradoxical as it may sound, on the strength of this fact we can produce a stereoscopic picture of a photo or a moving picture by looking at it with *but one eye*. The effect is most striking when you exclude from the horizon of vision everything that does not belong to the picture you wish to "stereoscopize," in short, when you look through a hole made by your fingers or cut in a sheet of paper. Now, the analogous effect can be produced in the acoustic sphere. By listening to your radio music with but one ear, while the other is blocked as tightly as possible, you will be deceived in a similar way; the effect of depth will be far more obvious than ordinarily. However, the two-set arrangement is more convincing and satisfactory.

Needless to add that the effect depends very much on where you place yourself. It loses its power when you arrange the radios too close to each other, thus making them *one* sound-source, *one* radio again. The optimal effect seems to result when you place yourself in the very center. After a short trial and error period you will easily find out the point at which the two "music-images" suddenly merge. Again and again, by lowering, or even shutting off, one of the two radios, the fundamental difference between the "flatness" of the one-radio effect and the three-dimensionality of the stereoscopic arrangement can be tested.

Now, it would be unreasonable, even proof of very poor taste, to apply this trick indiscriminately to every kind of music. There are compositions which *wish* to produce an impression of thinness or even flatness, the same way as a Byzantine mosaic or even a Puvis de Chavannes mural wishes to be looked at as a two-dimensional work of art. There are even cases in which the one-set radio transmission not only does not distort the original but actually "improves" it. (Purely linearic music, violin-solo sonatas, and the like.) Artistically, the acoustic stereoscope is justified only when used for heavily orchestrated music. . . perhaps for piano music of the nineteenth century that, to a large degree, is conceived in orchestral terms. In most cases chamber music seems to be distorted by the duo-trick. When flanked by a Bach "invention," played on the cembalo (by two radios) you will hear a piece that has little in common with the original. . . just as little as a sculptured version of a mosaic would have in common with its original, or as a Stokowski transcription of a Bach fugue has with this fugue.

* * *

In a way, our term "acoustic stereoscope" may be too modest, for there is a difference between the optical and the acoustic arrangement that is in favor of the latter.

The optical device suffers from the disadvantage of presenting *depth without movement*, thus always producing an oddly "dead" dollhouse impression; it combines three-dimensional reality with image-like immobility and irreality. The full effect of space would be conveyed only if changing vistas (as offered by moving pictures) would be combined with the impression of depth, for space- and depth-perception are closely bound with locomotion, at least with sensomotoric acts. In negative terms, the stereoscopic view again and again resists the attempts of the eyes to wander around in the "depths" it offers. Although deceiving the eyes, its deceptive character always remains perceptible.

Now, our acoustic stereoscope is free from this defect; it actually *combines space-impression with movement*. As a matter of fact, it is no "image"

any longer; except for technical and accidental shortcomings of transmission, there is no difference between the hearing of music in a concert hall and the hearing of it by means of the stereoscope. The music we hear, is not a "view" or a "reproduction" of a Bruckner or a Mahler symphony, but the "symphony itself." The distinction between original and copy (or reproduction) has lost its validity.

If in the "acoustical stereoscope" movement is not excluded (as it is from the ordinary stereoscope), if our hearing is not immobilized as our eyes are when they look into the paralyzed landscape, this lack of immobilization has a very strange philosophical reason. It is the fact that in the visible world we have the *freedom* of movement, while in the acoustic world we are *unfree*: we are always led by the strings of the musical object itself, for the object is a "process." Facing a painting, we have the freedom of looking first to the right, then to the left corner; faced with a musical composition, we are carried by the stream inherent in the music itself; we do not move ourselves within the musical "object," but we are being moved, led along by it. *While the optical stereoscope deprives us of the freedom of sensomotoric movement, we cannot be deprived of such a freedom by an acoustical gadget, since we lack this freedom anyhow.*

Whatever the reason, while listening "through" the acoustical stereoscope, we are confronted by the "real thing," by the real Tristan music or the real Bruckner symphony. Not providing us with an "ersatz," our acoustic arrangement has a far higher *art value*, than the optical device. While no sincere student of History of Art would make use of a stereoscope to familiarize himself with, let me say, the interior of Gothic churches, the student of music, accustomed to records and radio anyhow, will make use of the "acoustical stereoscope" without having the feeling of just fooling around with an amusing plaything.

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