

Marie Jaëll: La Musique et la psychophysiologie (1896)

Following the 1894 publication of her manual, *Le Toucher*, published in 1896, *La musique et la psychophysiologie* is Jaëll's attempt at coalescing the more philosophical underpinnings of her pedagogy. Whereas the earlier manual is more conventional—it is primarily a compendium of exercises—the latter is a treatise of remarkable scope and erudition. Across nearly 200 pages of prose, Jaëll is in dialogue with the preeminent scientific voices of her age, including Bain, Spencer, Darwin, Helmholtz, Wundt, and many others. She marshals these voices to lend support for her basic claim: the psychophysiological principles that govern sensation and perception are applicable to musical aesthetics. Moreover, for pianists specifically, fingerprints are visual representations of different types of touch, and may be used by teachers and performers to identify and correct poor technique. Jaëll's ultimate and most profound assertion is that physical sensation and activity are inextricably linked with the beauty of the musical work. The methodology she develops here and in other treatises is designed to make the connections among musical composition, mental image, sound, and tactility stronger with practice.

La musique et la psychophysiologie features ten chapters covering a variety of topics ranging from musical aesthetics to physiology to more ordinary issues concerning expressive timing, fingering, and harmony. Chapter 1, "Le mécanisme de l'expression musicale," adumbrates Jaëll's theorization of musical aesthetics, namely the connection between the acoustic properties of sound, which Jaëll understands to be mechanical or, we might say, material, and the intertwined mechanics of human physiology and the piano. She writes: "It will necessarily be proven that, for the study of fingering [mécanisme], every action of the fingers can, by its own nature, create precise mental reactions. ... Every performer acting in a visible way on the movements of his [or her] fingers will act in an invisible but no less real way on his [or her] mental activity. Thus is established a logical correlation between the progressive development of the perfection of the movement of the fingers and of the musical feeling of the performer (4)." (Il sera nécessairement prouvé que, pour l'étude du mécanisme, toute action des doigts pourra, par son caractère propre, créer des réactions cérébrales précises. [...] Tout exécutant agissant d'une façon visible sur les mouvements de ses doigts, agira d'une façon invisible, mais non moins réelle, sur son activité cérébrale. Ainsi s'établira une corrélation logique entre le développement progressif du perfectionnement des mouvements des doigts et du sentiment musical de l'exécutant).

Chapter 2, "L'attention et le sens musculaire," is an elaboration of Jaëll's notion of attention, which accords with nineteenth-century psychophysiology, particularly the ideas of Marey, Bain, Wundt, and Charles Féré, with whom Jaëll would collaborate

on several experiments in touch and reaction time in 1896-7. For Jaëll, a pianist's attention to outside stimuli, such as notated music or the sensation of playing, impacts physical movement. She analogizes attention to temperature; heightened states of attention correspond to tension in the muscles (17). In learning to bring attention and motion into greater alignment, pianists also learn to conserve physical energy, which assists in more efficient and, importantly, more "conscious" practice.

In chapter 3, "Le toucher et le sens auditif," Jaëll again takes recourse to nineteenth-century psychophysiology. In doing so, she posits that, as vibration, sound is physical and mechanical. In turn, the physical production of sound by the pianist's body can be studied using the same ideas and tools from psychophysiological acoustics. As she asserts in chapter 1, musical aesthetics can be theorized within the same paradigm of motion. Therefore, she writes, "The art of touch communicates musical feeling not only by the acquired speed of the movements of the attack, but also by the driving force of the contact (37). (L'art du toucher communique le sentiment musical non seulement par la vitesse acquise du mouvement de l'attaque, mais par la forme motrice du contact).

Titled "L'Étude," Chapter 4 is an introduction to Jaëll's definition of study. In this chapter that Jaëll again stresses that a beautiful pianistic touch—which is itself a manifestation of the aesthetic content of the musical work—begins with thought rather than action. To that point, Jaëll disavows pedagogical programs that lend themselves easily to overwork, particularly because they train the body and not the mind. She draws this conclusion from contemporaneous psychophysiology, writing, "The laws of physiology condemn any [excessively] prolonged study; the laws of aesthetics condemn the same" (54). In an especially interesting passage, comparing us to cameras, Jaëll suggests that failing to isolate and link mental impulse and physical movement is akin to double exposures. The goal for pianists is therefore to generate a multitude of physical-mental "snapshots" in practice, each of which permits self-observation and correction. The result, she notes poignantly, is the development of "the ability to think the notes [penser les notes]" (69). Her fingerprint methodology, which Jaëll will continue to refine across her oeuvre, is undoubtedly one realization of this aspiration.

Chapter 5, which she devotes to rhythm, meter, and *rubato*, is where Jaëll makes her strongest case for the link between acoustics—namely the notion that all sound is vibration—and musical learning. More specifically, Jaëll's extrapolates her understanding of frequency, which she adapts from Helmholtz, to meter. She theorizes that a measure of 3/4 or 9/8 is composed of 3000 "rhythmic oscillations," which are divisible into rhythmic values proportional to the measure in which they are found (77). Continuing Jaëll's logic, the ear can process tone and rhythm in the same way. More crucially, and paradoxically, such precision in processing is the foundation for artistic expression, permitting the performer to in a sense micromanage expressive timing, dynamic shading, articulation, and other nuances on an extremely refined scale.

Like chapter 5, chapter 6 addresses the matter of expressivity under the rubric of "interpretation," which is based on three fundamental principles: 1) knowing the science of acoustics, pianists must always produce a beautiful sound, guided by

their understanding of the harmonic series; 2) pianists must be able to “graduate” the amplitude of the waves ranging from the faintest to strongest in coordination with the harmonic content of the work; and 3) pianists must have a complete conceptualization of the rhythmic content of the work (rhythm) and execute it with precision. Given the simplicity of Jaëll’s model for interpretation, it would be reasonable to question this model’s accessibility and efficacy. In other words, how could interpretation, so bound up with expression, be artistic if it is not unique to an individual pianist? For Jaëll, artistry must develop through the composition itself; all necessarily “expression” is contained therein. “The imagination of the performer will develop under the influence of the character of the works performed by him [or her],” she writes, “The expression realized through the execution of a work will enable him or her to better grasp that of another. A progression in his or her musical ideas must occur, from the simplest to the most complex piece, by an uninterrupted transmission of various influences.” In other words, to be a good performer is to be attuned to what is inherent in the work itself.

After a brief chapter on the use of the pedal, in Chapter 8, Jaëll contends that movement is better retained in the pianist’s memory when associated with harmony and melody. Referencing an experiment conducted by Féré, Jaëll explains how hand positions may be correlated with specific sonorities. Such sonorities include speech, as in the case of Féré’s findings, as well as musical sounds. To exemplify the latter, Jaëll references Liszt’s habit of shaping specific musical intervals with his hands away from the keyboard, which would help the composer recall the sonority he wished to use at that moment. More germane to her role as a pedagogue, perhaps, Jaëll points to the link between motion of the hand and memory as evidence that musical skill may be acquired. Skill is not, contrary to some assumptions, an innate disposition. She writes, “But let those who feel so predestined be careful, since they may be surpassed by those who, without being predestined, arrive [at the same place] through a judicious labor whose results are more securely acquired, more aware [conscients], and thus more capable of moving from progress to progress” (128). (Mais que ceux qui se sentent ainsi prédestinés prennent garde, car il se pourrait qu’ils fussent dépassés par ceux qui, sans y être prédestinés, arrivent par un labeur judicieux à des résultats plus sûrement acquis, plus conscients, et deviennent ainsi aptes à marcher de progrès en progrès). Crucial here is that Jaëll attributes aptitude for learning to an improvement in a pupil’s “awareness,” which can be trained, and that such progress is made incrementally. Jaëll’s assertion in this context thus accords with the scaffolding of her earlier manual, in which the exercises are, at least to some extent, graduated in terms of difficulty.

It is in Chapter 9, with her discussion of the “Accélérateur du toucher,” that Jaëll is perhaps at her most “scientific.” That is to say that, although the idea of experimentation suffuses this treatise, this chapter explicitly mentions a laboratory instrument—the “touch accelerator”—and describes how it can be used to strengthen the fingers. The accelerator features two cylinders that are free to turn, fixed to a wooden plank, and placed in the subject’s lap. The subject then strikes the cylinders and sets them rolling as quickly as possible and in rapid succession, the goal being to increase both speed and force. The instrument does not record anything; rather, the subject registers the different kinds of sensations—and

whether any of these are improving—and then applies that knowledge to subsequent “experiments,” including the type described in her 1894 treatise. In a section of this chapter titled “L’agencement rythmique des mesures,” Jaëll argues that the refined touch trained by the accelerator can be used in musical practice as follows. Given that different meters have measures composed of strong and weak beats and that, certain fingers, namely the index and medial, are by nature stronger and can generate a bigger sound from the piano, fingering indications should reflect these two ideas. That is, notes in strong metrical positions should be played with stronger fingers, weaker positions with weaker fingers. This theory is not unique to Jaëll; it appears in some of the earliest manuals for keyboard instruments.

Although she titles Chapter 10, “Les sensations des auditeurs,” it is in this final chapter that Jaëll makes her strongest case for a pedagogy of increased consciousness. A state of enervated attention is not just required of pianists. Listeners, too, are often unable to recall musical details; worse, they are oblivious to some of music’s most subtle and sublime qualities, hypnotized by “eccentric,” frivolous, and otherwise “unconscious” performers. She writes,

Unconscious listeners are like hypnotized subjects who can be made to believe anything. They are convinced by every extravagance. Dysregulated behavior appears to them as the very sign of inspiration; a performer’s eccentric movements exact a magnetic power over them; on command, they hear wrong notes that are right, that an ugly sound is beautiful, that an incoherent style is lucid, that a misinterpreted rhythm is captivating, that a distorted phrase is sublime (154). (« Les auditeurs inconscients ressemblent à s’y méprendre aux sujets hypnotisés, auxquels on peut faire tout accroire. Ils sont convaincus par chaque extravagance. Une attitude déréglée leur semble le signe immédiat de l’inspiration; les mouvements excentriques d’un exécutant peuvent exercer sur eux une puissance magnétique; au commandement, ils entendent que des fausses notes sont justes, qu’un vilain son est beau, qu’un style incohérent est lucide, qu’un rythme à contresens est entraînant, qu’une phrase dénaturée est sublime. »)

Given that making music and listening to it are essentially two sides of the same coin, it is essential that pianists marshal their attention to nuance effectively, lest the listener be left in a state of cognitive-artistic aporia. The role of the pedagogue is thus equated to the role of the experimental scientist, whose insights are meant to bring the invisible to light. “In reality,” Jaëll writes, “art and science seem to have to pursue a common goal: to combat unconsciousness.” She continues: “The teaching of music must prove that musical feeling is not necessarily an unconscious force, but it can be created by mental effort, through whose impulses transform the movements of his or her fingers and the physiological state of his or her organism” (161). (« En réalité l’art et la science semblent devoir poursuivre un but commun : combattre l’inconscience. L’enseignement de la musique doit prouver que le sentiment musical n’est pas nécessairement une force inconsciente, mais qu’il peut être créé par l’effort intellectuel sous l’impulsion duquel l’exécutant transforme les mouvements de ses doigts et l’état physiologique de son organisme. ») With her treatise, Jaëll raises the stakes for music education, portraying the teacher, performer, and listener as collectively responsible for the accurate and sensitive transmission of the musical work.

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