[*The note at the top of the letter is illegible*]

Considered in the ratio of their forms and their identical parts, all the material objects can be distributed into two main classes: those which, when placed in front of a mirror produce an image that can be superimposed onto them. The image of the others could not cover them, although it faithfully reproduces all their details.

To summarize the main facts expounded in the previous lesson, Mr. Pasteur highlights that the most general consequence of the work he has expounded is to assign amongst any chemical combinations, two classifications of bodies each offering the characteristics we recognize in our material objects; that is to say, any molecular group is always image-super-imposable, or non-image-super-imposable.

In addition to this, this results into the facts expounded in the previous lesson that the characteristic of molecular dissymmetry resides, firstly, in the non-super-imposable hemiedry, secondly, and most importantly, in the rotary property in the state of dissolution. And it is precisely through studying all the chemical compounds within this double ratio, that we are able to ascertain that some are indeed symmetrical with a super-imposable image, whilst others are dissymmetrical with an image that cannot be superimposed to the reality that produces it.

This being said, a very interesting fact appears here; it is that all mineral species are image-super-imposable, as are all the laboratory species, be they mineral or organic. In contrast, the characteristic of molecular dissymmetry manifests itself in almost all the immediate principles conceived under the influence of life.
Here Mr. Pasteur seeks to clarify a few objections that could come to mind. He shows that neither quartz, nor [*?*] formate, nor sodium chlorate are exceptions to the generality of this theory, and that in these products, the dissymmetry is entirely physical, due to the layout of the molecules within the crystal, and not to the atomic group, which constitutes the chemical molecule. Also, as soon as the crystal is destroyed, a result that is easily obtained through fusion or dissolution, any dissymmetry disappears in all three substances.

The clear and accurate feeling of the veracity of the double statement we have just indicated served as a guideline to Mr. Pasteur in a very curious discovery, which thoroughly expands the considerations related to the molecular dissymmetry of natural products.

In 1850, Mr. Dessaignes announced that he had managed to transform [*ammonium bicarbonate*] into aspartic acid and that a careful study had made him identify the artificial acid with the acid taken from asparagine. Until then, nothing but natural from the point of view of chemistry or optics. On the one hand, Mr. [*Piria*] had shown that it was possible to go from aspartic acid to malic acid; on the other hand, Mr. Pasteur had recognized the molecular dissymmetry in asparagine, aspartic acid and malic acid, whatever the origin of the latter.

But Mr. Dessaignes also announced later that the transformation into aspartic acid could be carried out with the help of ammonium maleate. And because, for his part, Mr. Pasteur found that maleic acid is not dissymmetrical, the result was that Mr. Dessaignes would have transformed an image-super-imposable body into an image-non-super-imposable body, a unique fact until then. But things are not as Mr. Dessaignes believed. Mr. Pasteur recognized that artificial aspartic acid is only a [*?*] of the natural acid and that it is different, notably in the absence of any molecular dissymmetry. [*To his aid*], Mr. Pasteur obtained non-dissymmetrical malic acid, and since he has managed to prepare non-dissymmetric tartaric acid and [*angelic*] alcohol. Mr. Pasteur insists once again on the relationships of molecular groups of these artificial organic bodies and the same bodies born under the influence of life. He shows that the first differ from the latter only because they are somewhat [*?*]; they have lost the dissymmetrical property typical of the molecules conceived under the influence of life. He then draws this notable consequence from his research, that there are four possible dispositions for the atomic groups that constitute matter: the right, the left, the combination of right and left and the non-dissymmetrical [*?*] group, which is neither left, nor right, nor made up of the combination of left and right.
Only, from what has been demonstrated previously, one could fear to never be able to discover the [*?*] groups of the natural groups because chemistry has until now proved incapable of giving any product a molecular dissymmetry. This fear would be exaggerated, because Mr. Pasteur has shown that through artificial [*isometric*] transformations, it was possible to go from a right body to its left, and he therefore expounds the transformation of right tartaric acid into left tartaric acid and vice-versa.

Mr. Pasteur [*?*] into the developments that it would be too long to [*?*] on the relationship of properties of corresponding right and left bodies. He proves that the identical but opposite substances have [*?*] the same physical and chemical properties each time they are put [*in presence*] of non-dissymmetrical bodies, with a super-imposable image, and that, conversely, they totally differ when they are associated to bodies, which are, like them, dissymmetrical, and more generally to dissymmetrical actions. Therefore, whilst right tartrate and left tartrate [*?*] are of a perfect identity in the [*?*], apart from the impossibility to superimpose their forms [*?*] at the opposite of their optical deviations, the right and left tartrates [*?*] or [*?*] and generally any [*?*] dissymmetrical differing from one another as much as two of the most remote isomeric bodies.

Mr. Pasteur thus shows how this facts lead to believe that molecular dissymmetry occurs in natural substances through the action of dissymmetrical forces.

He concludes with the exposition of an extremely interesting fact, as much from the physiological point of view as the chemical point of view, and which recently impacted on the members of the physiology prize commission. Mr. Pasteur recognized that, under certain influences, paratartaric acid, a combination of right tartaric acid and left tartaric acid, could ferment, but that the particular yeast that is seen in this operation only destroys the right tartaric acid without touching the left tartaric acid, which [*?*] [*?*] the best way to prepare this acid

today. Be that as it may, as Mr. Pasteur carefully noted, the characteristic of molecular dissymmetry - this characteristic that is typical to [*?*] to the molecules conceived under the influence of life - comes in as a powerful modifier of the chemical [*?*] in a physiological phenomenon. Because it is not possible to attribute the difference presented by the two tartaric acids regarding their formulation to anything other than the difference of their molecular dissymmetry.

[The note at the end is illegible]