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## Original Communications.

## THE HISTORY OF GERMS, AND ITS APPLICATION TO MEDICINE AND SURGERY. BY DRs. PASTEUR, JOUBERT, CHAMBERLAND.

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*Concluded.*

"We have distinguished the carbuncle bacterium, and the septic vibrio, as agents of contagion, disease, and death, not because they generate chemical poisons, but because the animal economy can afford them the means of culture. We now have to notice a third species, equally capable of multiplying in the living body, and of provoking in it a pathological state, different, as will be seen, from the morbid manifestations which arise from inoculation of the carbuncle bacterium, or of the septic vibrio. Here we have a proof that the pus formed by our organism is allied to the specific character of its structure. The quantity of pus, for example, furnished by the bacterium and the septic vibrio, at the point of inoculation, and outside of it, is so little apparent, that it frequently passes unnoticed.

The microbio of which we now treat, may propagate itself through all the muscles, penetrate into the blood, into the lungs and the liver, and determine in these organs the formation of purulent foci, metastatic abscesses,—in a word, a purulent infection and death. This invasion, however, of the whole body, is much more difficult than that of the carbuncle bacterium, or the septic vibrio. Whilst the inoculation of the most minute quantities of the latter organisms conducts, so to say, infallibly to death, that of our microbio, in similar proportions, is limited to the production of abscesses which cure spontaneously, either because they suppurate and open, or because the pus is resorbed, and the

microbio which accompanied it disappears, conquered by that which I would call life, vital resistance, *vis medicatrix*. If, however, the number of abscesses have been increased by that of the inoculations, it frequently happens that the cure of these cannot be effected, and it is then the microbio penetrates through every part, and the muscles become as if impregnated by it.

We may say that this new organism, previously subjected to a temperature of 110° C. (230° F.) and thus entirely deprived of life, yet preserving its form and volume, provokes, when inoculated under the skin—in the same manner, as inert solid bodies, abscesses consisting of pus entirely pure, free from smell, and devoid of living organisms. This mode of inoculation does not, however, permit the production of abscesses in the viscera. In these conditions the dead microbio operates only locally; but in the same manner as when inert bodies are injected into the blood, and the formation of metastatic abscesses is provoked, so also, it is easy to obtain such abscesses either by the living, or the dead microbio, by injecting substances containing it into the jugular vein. In this case, the lungs, and especially the liver, become filled in twenty-four hours with an infinite multitude of metastatic abscesses, in all stages of evolution, from the mere inflammatory blotch to the small white pustule, full of pus, surrounded by a yellowish areola. As regards cure, that is the disappearance of the abscesses, matters progress differently in the two sorts of inoculation. The animal inoculated with the living microbio almost always dies speedily, and any part of the liver or the lung immersed in an inert liquid, reproduces the microbio. If the consequences of the inoculation have not been fatal, the disappearance of the abscesses and of the microbio in the viscera, is more slow than in the cases inoculated with the dead microbio. It may therefore be inferred from the preceding facts, that pus, accompanied by living microscopic beings, whose life is possible in the animal economy, gives place to disorders of greater severity, and more difficult of resolution, than pus, which may be called pure.

We have here an example of a purulent infection localized in the viscera, and provoked by extraneous bodies; or by pus entirely free from living organisms. It is the case of the thorn of Van Helmont. An extraneous body leads to formation