

to the fact long ago clearly demonstrated by Lubarsch, that whereas 1 c.c. of shed blood will kill thousands of anthrax bacilli, a much smaller number of the bacilli introduced into the circulating blood will surely cause the death of a rabbit, i. e., will not be killed in the circulating blood but will proliferate abundantly; or to the abundant further evidence that we possess, that the bactericidal powers of the circulating blood are relatively slight, whereas those of the shed blood are remarkably powerful. In the act of coagulation it is that the bactericidal substances are in the main liberated. If but a few bacteria be in the blood removed from a vessel, and a drop of that be smeared over the surface of agar or blood serum, no wonder that the results are negative. That drop of blood alone is capable after coagulation of destroying hundreds, not to say thousands, of such bacteria as the colon bacillus. Even if, as Warren White proceeded to do, 0.5 c.c. of blood be mixed with 5 to 10 c.c. of agar or other medium, the dilution is too slight to greatly inhibit this bactericidal action. No wonder then that in his series of observations, only those forms, and just those, relatively resistant to the bactericidal action of the blood serum, managed to proliferate and to form colonies.

Thus it happens that those who have employed solid media have had a succession of negative results; those who have freely diluted the blood and the chyle have more often gained positive results. It is not that the bacteria have been of necessity absent from the blood, it is that the proper means were not taken to favor their growth.

What is true of the blood is true also of the bile. Compared with the blood the bile has such slight bactericidal effects that most observers have denied that it has any at all. My own observations show me that it has a slight bactericidal and inhibitory action on the growth of bacteria. Here, as with the chyle, if relatively large numbers of bacteria from a pure culture be added, they grow immediately and abundantly, but if the number be small, they tend to be destroyed. Dr. Maude Abbott, working in my laboratory at the Royal Victoria Hospital,