

drops of fluid should be added to the sponge at any one time. If more is added, it will cause undue irritation. The fluid should not be poured on the sponge more than two or three times in twenty-four hours. Precisely the way in which creasote is most useful is, perhaps, difficult to state. By its antiseptic action, it is possibly destructive of bacilli; by its local action and general effect, it is certainly of value in combating catarrhal conditions. Where purulent cavities exist, it tends to destroy or neutralize putridity. These are certainly sufficiently good reasons for its use without pursuing the enquiry further. At all events, these inhalations do good. The physician notices it and the patient affirms it. In many instances they allay cough better than any cough-mixture, and they are certainly free from great objection of destroying appetite, as opium and morphine so frequently do.

We now come to the third and last topic of to-day's lecture and that is, *The Utility of Intra-pulmonary Injections in Pulmonary Phthisis*. I, for one, gentlemen, believe they do good. I also believe they rarely do any harm. They may occasion localized pleuritis, slight hæmoptisis or cutaneous emphysema—but that is about all. They certainly allay cough, diminish the quantity and change the character of the sputa, and in some remarkable manner, have at times manifest power in lessening the distressing symptom *dyspnoea*. This method of treating lung cavities was first employed in this country by Professor Pepper in 1874; since that time, and except by Dr. Pepper himself, I am not aware that any one but myself has practiced these injections any considerable number of times. I have now made between forty and fifty intra-pulmonary injections, and am disposed to continue them in favorable cases. Of course, it is often a difficult thing to follow up any particular line of treatment in private or hospital practice on account of the prejudices or fears of patients. Thus it is with intra-pulmonary injections and in a similar degree, perhaps, with forced alimentation already fully described. Whenever this little operation can be performed, it is, in reality, a very simple matter.

The point of a fine cannulated needle should be inserted in the first, second or third intercostal spaces, anteriorly, or in the axillary region. While there is no risk in making injections upon or outside of a vertical line passing through the nipple on either side, there is danger in injecting at any measurable distance within this line, for fear lest we penetrate the pericardium or one of the great thoracic vessels. The needle should be inserted from two and a half to three inches. Of course, if considered necessary, the slight pain of the puncture may be annulled by the use of local anæsthesia. I have made use of iodine usually in my injections, and am now employing a solution of the compound tincture, of the strength of one part to four parts of distilled water. From ten to twenty minims may be injected upon each occa-

sion, and the injection may be advantageously repeated in four or five days. Previous to the introduction of the needle of the Pravaz syringe, the patient fully expands his lungs, and retains the air in them during the few moments it takes to make the injection. Slight or moderate cough, some expectoration, streaked or not with blood, may follow the injection, and for a day or two there may be slight localized pain in the region where the injection was made. Further than these symptoms, little or no reaction accompanies or follows the injections. In many cases, as in that of the man whose chest I have just injected for the *third* time within ten days, there is no reaction whatsoever at the time of the injection, inasmuch as he does not even cough. I have told you this patient has a cavity at the right apex.

One of the gentlemen wishes to know how I am assured that the point of my needle has penetrated the cavity. The answer is very simple: By giving a slight movement in different directions to the body of the syringe, we can readily appreciate whether or not the point of the needle encounters any resistance, or is perfectly movable in an empty space, or one only partially filled with semi-fluid material. But, presuming for a moment that I cannot be always confident that I have struck the cavity, does it matter? Practically, and according to me, no. That is to say, if you fear any bad results simply because the injection has been made into solidified tissue about the cavity. Indeed, I am more and more convinced that the best indication for these injections is in cases where the apices are *solidified*, and not *softened*. I am borne out in this belief by my own experience. I have already injected in nearly as many cases of phthisical infiltration at its first stage as at a later period, and I have ordinarily seen apparent benefit result. As to the slight accidents that do occur, they can be easily allayed by an anodyne, external irritation of the chest or rest in bed for a day or two. Of course, when we inject a cavity, we have distinct objects in view, and, if we do not reach the cavity, we fall short of doing what we purposed to do. These objects are, mainly, to disinfect the sputa and to modify the walls of the cavity, so that it will, little by little, tend to close up and cicatrize; and, in producing this result, we shall also expect the amount and character of the secretions from the lung cavity to be sensibly changed for the better. When we inject solidified lung tissue we expect something very different. If there is an underlying inflammatory cause, in very many cases of phthisis—and I still believe there is—we shall modify this inflammatory exudation considerably. We shall, perhaps, produce such changes in it as to render it fluid and easier of resorption or expectoration. As to the influence of iodine or other injections on the growth or vitality of bacilli, I have yet no very positive and determined views—any more, indeed, at this moment, than I feel perfectly sure in regard to the real, active rôle of the bacillus itself. Only a few months ago, the chorus