micro-organism, and the factors which co-operate in finally providing so graphic a conclusion as the crisis with which we are all familiar.

We have, however, certain knowledge of a positive character which has been very slow to secure a position in what should be the everyday thuoght of our profession—certain underlying principles which should govern the handling of every case of pneumonia, and which would go far not only to reduce the mortality, but also to prevent the incidence of pneumonia in other subjects.

Before entering upon this phase I am desirous of calling your attention to some of the difficulties which beset the research worker in advancing in his quest of relief from our present condition of subservience to this disease.

I have yet to meet a laboratory worker in this field who feels enthusiastic in his outlook on the pneumonia problem. Why is this the case? The first great difficulty is our inability to produce in laboratory animals lobar pneumonia as we see it in man. Our common laboratory animals are susceptible to infection with the commonly accepted pathogenic organism of this disease, i.e., the pneumococcus; but they react to artificial inoculation in widely varying degree from total immunity, such as is found in the pigeon, to severe septicæmia, such as occurs in the rabbit, guinea pig, mouse, and rat. We are able to produce, it is true, fibrinous exudate at the site of inoculation accompanied by hæmorrhage and œdema, with occasionally increased peritoneal and pleuritic fluid; but this does not mean a lobar pneumonia. One animal, the dog, if the work of Meltzer be confirmed, responds to intrabronchial infection of broth suspensions of pneumococci by a lobar condition similar to the natural condition in the human patient suffering from pneumonia. This may establish a confirmation of the belief based upon bacteriologic studies on pneumonic lungs that the pneumococcus is the main organism responsible for pneumonia in man, and may lead to an experimental basis which will permit of a study of the underlying physiological and biological principles of the onset, progress, and cure of lobar pneumonia infection.

A second great difficulty lies in the symbiotic action of micro-organisms which surrounds the relation of the pneumococcus infection of the human body. The pneumococcus is so continuously associated with other organisms in the normal mouths and so frequently in pneumonic lungs that more than a suspicion is justified that the secondary organisms have some relation to the virulence of the infection. In this connection I would call your attention to the experiments of Park and Williams (1), who found that mass culture results in more virulent strains of pneumococcus and more frequent entrance of these into the blood strain. Mass culture is obtained by inoculating sputum into broth, allowing this to