masked or neutralised, and yet any infective matter present, be, in all probability, unaffected, preserved, or only made dormant for a brief period, as exhaustive experiments with carbolic acid and infective fluids, more especially with vaccine, show; that to use purely antiseptic substances as antizymotics is highly paradoxical, preservation being practised and destruction anticipated; further, that the mineral acids are true disinfectants, operating by both physical and chemical destruction, and also by transformation, of organic molecules, as in fermentation; hence, they prevent and arrest putrefaction, they transform putrefaction into fermentation; they deodorise; and, moreover, they are highly antizymotic as regards vaccine, virus of glanders, virus of infective inflammation, and therefore, by inference, as regards all other infections.

ENLARGEMENT OF THE BRONCHIAL LYMPHATIC GLANDS WITH RELATION TO WHOOPING-COUGH.

By W. B. CHEADLE, M.D., F.R.C.P.,

Physician to the Hospital for Sick Children, Great Ormond Street; Senior Assistant Physician and Lecturer on Pathology, St. Mary's Hospital.

THE theory that compression or irritation of the vagus nerve by enlarged bronchial glands is the cause of the spasmodic cough in whooping-cough, advocated by Dr. Gueneau de Mussy and combated by Dr. Barlow, is no new one. Some quarter of a century ago, Dr. Ley, having observed the frequent association of laryngismus stridulus with swelling of the glands of the neck and chest, and the entanglement of the pneumogastric nerve or its branches amongst them, attributed the temporary closure of the glottis in this affection to pressure made by these enlarged glands upon the recurrent laryngeal nerve, or some part of the eighth pair. And again, later, finding a like condition of these structures in whooping-cough, he suggested that the enlargement of these glands from a specific poison, similar to that of the parotid gland in mumps, might after all be the essence of whooping-cough. These views were brought forward and favoured by Sir Thomas Watson in his well known lectures. The revival of the theory by Dr. Gueneau de Mussy gives it fresh prominence and importance.

Now, I think, most pathologists would agree upon two primary propositions connected with the question, viz.:

1. That the spasmodic cough and laryngeal spasm of whooping-cough are due to some morbid influence acting upon the vagus;
2. That enlarged bronchial glands are constantly found on *post mortem* examination in all fatal cases of the disease.

The single instance of well marked whooping-cough in which a *post mortem* examination shall show this last condition to be absent, required by Dr. Gueneau de Mussy to refute his theory, will, I imagine, be sought in vain.

The absence of such evidence against the hypothesis does not, however, establish its correctness.

The evidence of physical examination during life supports that obtained *post mortem*, and I believe that, in whooping-cough, enlarged bronchio-tracheal glands are always present. But it by no means follows that the two conditions stand in the relation of cause and effect. They are rather, I think, both effects of a common cause.

The difficulty in the way of what may be called the compression theory is precisely that put forward by Dr. Barlow and Dr. Archambault, and combated so ingeniously by Dr. Gueneau de Mussy; viz., the fact that a similar enlargement of the bronchio-tracheal glands is commonly met with in other pulmonary affections besides whooping-cough. And, even further, I think it may be stated as a general pathological law that, *whenever there is prolonged inflammation or irritation of the bronchial mucous membrane in children, enlargement of the bronchial glands certainly follows.* We see it in the *post mortem* room as the accompaniment of bronchopneumonia, of phthisis, of measles, of whooping-cough. Swelling of the bronchial glands, indeed, results from an inflamed bronchial mucous membrane, just as certainly as swelling of the cervical glands follows an inflamed scalp. This enlargement, then, being present in many disorders other than whooping-cough, without any spasmodic cough (as Dr. Gueneau de Mussy fully allows), if the tumefaction of the glands be the cause of the spasmodic cough in one case and not in another, it must be due to some special conditions present in the one instance and not in the other. It is in this respect that Dr. Barlow's case is so valuable. It clears the ground by showing positively that mere mechanical pressure is not the determining cause.

Dr. Gueneau de Mussy suggests that the determining conditions may be some qualification of pressure; as that the compression acts on certain points of the nervous cluster, or that it acts in certain special

degree, or that it produces a certain kind of stimulus which may depend upon the nature of the morbid process. It is difficult to see how such variations of pressure could produce the effect, and still more difficult to conceive how the nature of the morbid process could modify the influence of pressure by an enlarged gland; but, granting that such variations might afford a reasonable explanation of the phenomenon, they rest so far on pure hypothesis. Under ordinary circumstances, the act of coughing is excited by stimulus applied to the peripheral twigs of the pneumogastric, either those of the superior laryngeal in the larynx, or the pulmonary branches to the bronchi; or, in some cases, possibly by irritation of the gastric portion in the stomach; or again, the stimulus may be reflected, as, for instance, in cough caused by the act of laughing. Cough is set up in the same way in whooping-cough, by the stimulus of accumulating mucus in the larynx, trachea, or bronchi, or a blast of cold air, or a full meal, or a fit of laughter. It seems more reasonable to suppose that the peculiar spasmodic character of the cough is due to the special action of a special virus upon the terminal fibres, or to an irritable condition established by its influence on them or in the nerve-centres, rather than to the rough mechanical influence of gland-pressure. In the parallel case of the pressure of an aneurism or other tumour upon the recurrent nerve, we have spasmodic cough indeed, but not until the pressure has become extreme enough to produce paralysis of the vocal cord and persistent hoarseness and stridor of respiration. Then accumulating mucus in the narrowed glottis *does* produce violent cough. But in whooping-cough, there is no such evidence of persistent pressure. The only way in which it seems to me probable that enlarged bronchial glands can play any active part in the matter is, that the turgescence of the vessels and tissues of the neck, which results from the successive expiratory efforts, may so temporarily increase the pressure upon the inferior laryngeal, as to produce a momentary spasm of the glottis, and thus cause the characteristic whoop. But then closure of the glottis is part of the act of coughing, and the whoop would be accounted for by the spasm set up by special or extreme irritation being more persistent than that of ordinary cough. The occurrence of cough simulating whooping-cough is explicable in the same way, by excessive irritation and irritability of the nerve-fibres or centres involved. The recurrence of spasmodic cough, too, with each successive catarrh, months after the original attack of whooping-cough has ceased, is as easily explained by a persistent irritability of nerve-structures, as by a persistent tumefaction of bronchial glands. I agree with Dr. Gueneau de Mussy that these relapses of whooping-cough are not contagious; I have long been in the habit of allowing patients thus affected to mix freely with others, both in private practice and in hospital, and have never yet seen the disease communicated thereby.

A CASE OF PLEUROPNEUMONIA WITH EFFUSION TREATED BY THE ERGOT OF RYE: RAPID RECOVERY.

By ALEXANDER BOGGS, M.D., Paris,
Late of Her Majesty's Indian Army.

UNTIL now, the ergot of rye has been employed principally as an ocytotic, sometimes as a hæmostatic, and in certain affections of the spine. It has recently been employed as a febrifuge in typhoid fever, and as a local application in ophthalmia; but, having read of its utility in pneumonia, I determined to try it in the following case.

On May 20th last, I was called to see a young married woman aged 28, suffering from symptoms of some pulmonary affection. On examination, I found she had all the signs of the commencement of pneumonia of the right lung, the left being unaffected. She had been ailing for about eleven days, and, thinking she had only a "cold", continued her occupations as usual. On the 19th, however, finding herself prostrated with intense fever, she was obliged to lay up, and sent for me the next day. She complained of great pain in the lower and back part of the chest, accompanied with slight oppression and a continual cough; and as she was in a state of great agitation, with a full soft pulse and dry skin, I gave her a mixture composed of bromide of potassium, liquor ammoniæ acetatis, digitalis, and morphia, in some syrup and water, of which she took a tablespoonful every two hours. This had the effect of quieting the patient, but the other symptoms had not much abated. At my visit on the morning of the 25th, I noticed that the sputa were mixed with blood, and signs of the supervention of pleurisy of the same side became evident, accompanied with considerable effusion of fluid. I then prescribed a combination of the liquid extract of ergot of Bonjean with liquor ammoniæ acetatis, which she was to take every two hours. On the morning of the 26th, the patient was more oppressed, the effusion considerably increased, extend-