pitation or pain in the chest or arm. The pulse was 70. He said at first that he did not smoke much, but afterwards admitted that he had smoked far more than usual during the preceding week. One afternoon he had smoked seven cigars, and he was not used to smoking more than one or two. He said also that he chewed the ends of his cigars. He was told to stop tobacco and to report progress, but he did not return. A brother practitioner has, however, seen him since, and tells me that the peculiar breathing only lasted a few days after the smoking was discontinued.

The only satisfactory description of this symptom that I have been able to find is in a paper by Chapman, of Louisville, read at the Mississippi Valley Medical Society in 1891 (abstract published in the *Medical Record* and in *Sajous Annual*.) He described the breathing in a case of tobacco poisoning as irregular, consisting of several short shallow respirations, followed by one deep and gasping. He counted the respirations, and found them 20 to 22 per minute. I have to plead guilty myself to having failed to observe the kind of respiration intervening between the special deep inspirations to which I am drawing attention. As far as could be judged from the abstracts at my disposal, Chapman made no attempt to explain the peculiar breathing he described, and after a fairly careful search no explanation was found in the English literature within reach. Such a change in the breathing is in all probability due to some influence affecting either the respiratory centre, the pneumogastric nerve, or the blood.

It has been affirmed by many writers, though denied by some, that changes do take place in the blood in nicotine poisoning. It would seem, however, that any such explanation of the symptom in question may be excluded when we remember that in one of my cases the symptoms persisted for some months after cessation of the use of the drug.

In order to determine whether the respiratory centre or the pneumogastric nerve is chiefly affected, a somewhat detailed knowledge of the effect of tobacco on respiration is required, and as I could not find answers anywhere to some of the questions suggested by these cases, I decided to carry out a few experiments in the hope of settling the matter for myself.

Before describing the experiments I will take the liberty of reminding you in a few words of the principal factors in the nervous control of the respiration. There is a respiratory centre in the medulla which is divided physiologically into an inspiratory and an expiratory centre so distinct from one another that either one may be affected by stimuli which fail to influence the other. These centres may or may not be able to act automatically, bnt they are in any case profoundly affected by nervous impulses reaching them from the brain above and by various paths from below, especially by the pneumogastric nerves. The respiratory centres send their stimuli to the muscles of respiration by the ordinary spinal nerves such as the phrenics and intercostals. The experiments were carried out to determine as far as possible which parts of the nervous mechanism of respiration are affected in tobacco poisoning.

The apparatus used consisted of the well-known arrangement of Marey's tambour, shown in Fig. 71 of the sixth edition of Foster's *Physiology*. By this the movements of the air in and out of the chest can be recorded on a moving surface. A lever scratches curves on a strip of lamp-blacked paper in such a way that the upstroke of the curve reading from left to right corresponds to expiration, and the down stroke to inspiration. The amplitude of the curves is propor-