

part of one of these sheets. The lower tracing represents the normal beat, the upper represents the beat in the same animal a short time after it has been given a dose of alcohol. The lower shows six and a half beats; the upper, ten beats in a given length of time. Consequently we infer that alcohol increases the frequency of the heart beat. But another effect must be noted. The height of the lower waves is greater than that of the upper ones. We infer, therefore, that the strength of the heart beat has been lessened as a result of the action of the alcohol upon the heart muscle.

In fact three effects follow the administration of alcohol to a frog: (1) both the force and the frequency of the beats are increased, but only for a short time: (2) later on, the strength of the beat is diminished, but the frequency is maintained, just as shown in the upper tracing: (3) if more alcohol is administered, both the force and frequency are lessened, and finally the heart stops beating altogether.

A much simpler observation, and one which does not require the use of any apparatus, can be made upon any drunken man whom pupils may chance to meet upon the street, namely the flushed appearance of the face. The skin of the face and hands shows this condition most plainly; but the fact is that alcohol sends the blood in large quantities to the blood-vessels of the skin all over the body. This effect is best seen in the young. In the middle-aged and old the skin of the face and hands has grown darker in color, and the flushed condition of the blood capillaries is not so easily recognized; but in young or old the effect is the same.