

at any time by bandaging the eye and stopping up the ear. On the contrary, the normal condition of sleepiness that makes itself distinctly felt to the individual and that follows upon healthy active exertion of body and mind is most probably connected with a genuine fatigue of the vaso-motor centre, particularly, I believe, of the part controlling the skin vessels. When in this condition, only strong sensory or mental stimuli are adequate to keep the centre in tone and prevent a fall of blood pressure, and, if the fatigue is excessive, even such means fail and sleep ensues quite against the will.

The probability of a relationship between the supply of blood to the brain and the condition of sleep is indicated also by the phenomena preceding normal awaking. For some time before awaking the arm undergoes a gradual constriction, and in the half-hour or so just preceding awaking this constriction becomes comparatively rapid, bringing the arm at the time of awaking nearly or completely to its normal volume. Upon the explanation of the plethysmographic curve that has been adopted in this paper, these changes would mean that after a certain period of relaxation the vaso-motor centre gradually regains its tone, resumption being more rapid shortly before awaking. The result of this process is to force a greater and greater supply of blood through the rested brain until finally the threshold of consciousness is overstepped, and spontaneous awaking occurs. It is probable that under ordinary conditions awaking is almost always accelerated by the effect of some accidental external or internal stimulus. At the same time it must be admitted that if such stimuli were removed spontaneous waking would eventually follow the gradually increasing vascular tone. It is an interesting fact that, in the plethysmographic curves taken by the author, there was always a marked constriction of the arm at the moment of final awaking. As the subject awoke, he could see the pen rising rapidly upon the kymograph. The effect in this case seemed to be analogous to that caused by mental activity. The sudden increase in mental processes coincident with the access of full consciousness acted as a stimulus to the vaso-motor centre, and the constriction produced was sudden and marked. Subsequently the pen again sank a certain distance, remaining finally at a level approximately the same as that shown at the time of going to sleep.

The normal periodicity of sleep, which is its most characteristic phenomena and the one most difficult of explanation upon previous theories, is to be referred finally to the characteristic of the vaso-motor centre. The latter part of the paper refers to the opinions of others who have arrived at somewhat similar conclusions, more especially that of Hill, who advocates the theory that sleep depends on an anaemia of