

normally 100 per cent. of tone, yet it can give out 200 per cent. The upper motor neurone acts in an inhibitory manner by restricting it, and 100 per cent only is given out, but if this restricting power were removed, the tone would bound up in proportion to the loss of the inhibitory power anywhere to between 150 and 200 per cent. Let us take as a simile a violin, and screw one string up to C. Now, let us allow some dust particles to alight on the cat-gut, and by suddenly vibrating the string the dust particles will jump off, perhaps an inch distant. Let us screw the string up to F, and we should find that in vibrating the string the dust particles would rebound three inches. This goes to show that when the tone is increased or otherwise stretched up by mechanical force, impulse becomes greater. Slacken the string to A, and we should find that the tone is lessened, and the mechanical propulsive power is equally in proportion lessened. So it is in man. When we have the tone of our lower motor neurone normal, which is 100 per cent., and let us compare this normal condition as being equivalent to the violin string when tuned up to F, mechanical striking of the patella with the leg at right angles to the thigh throws the foot forward; in other words, the knee jerk is obtained. But if due to some injury or removal of the controlling influence of the upper motor neurone over the lower motor neurone, the tone of the muscle is increased 150 to 200 per cent., then the knee jerk becomes markedly exaggerated. We saw in the violin that when the string was slackened and the tone thereby lessened the mechanical impulse was also lessened. Now, when we have any disease affecting the lower motor neurone, the function of which is to supply tonic and trophic influences to the muscle, the tone becomes lessened, and we find the muscles in a more or less relaxed state, just as we find when we slacken the string of our violin, and here also we find that when we tap the patella the excursion forward of the foot is lessened or lost in proportion to the diminution in tone. Following this, as the lower motor neurone is the trophic centre, we find atrophy taking place, and also the typical signs of reaction of degeneration to electricity.

Now, let us take up what occurs when we have involvement of the *lower sensory neurone*. But before doing so, let me here state that any neurone, to be perfectly normal, must obtain sufficient nourishment and stimulation; removal of either will produce lessened vitality, with the result that its normal functions are lessened. We know that the axone of the lower sensory neurone enters the cord by way of the posterior roots; here it sub-divides and sends some fibres or collaterals to the cells in the posterior horns; other branches run forwards to the anterior horns, and there arborize around the cell bodies of the lower motor neurones. If by experiment or by disease the connexion between