has been removed without the appearance of untoward symptoms. The four parathyroid glands, each one about the size of a grape seed, which are located on the back surface of the thyroid, are essential in maintaining the normal calcium content of the blood. The loss of all four results in fatal tetanic convulsions, but the loss of only two is not followed by any disturbance at all.

Margins of Safety in the Nervous System. What holds true for paired organs also is true for various paired nerves. A pair of nerves called the vagus nerves, or vagi, form the grand trunk line for the outflow of nerve impulses to organs of the chest and abdomen from the cranial division of the autonomic nervous system. If both vagi are cut, the rhythm of respiration is completely changed, the heart beats considerably faster than usual, and digestion is seriously upset. Yet if only one of the vagi is cut everything goes on as usual.

The cerebrum has two hemispheres and might for that reason be called a bilateral or paired organ, but this is not a true designation in the sense that both hemispheres have the same functions. We know that the cerebrum is a collection of many centers, both sensory and motor, the injury of any one of which results in some sensory or motor disturbance in a definite area of the body. Motor centers in the left hemisphere control movements on the right side of the body, and those in the right hemisphere attend to muscular movements on the left. Removal or serious damage to one cerebral hemisphere results in paralysis on the opposite side of the body. This does not hold true, however, for muscles contracting on both sides simultaneously—for example, those used in swallowing and in breathing. In the case of these muscles the motor area of one side can take charge of the muscles of both sides and thus maintain functions that are required for continued existence.

Nerve cells, on the whole, do not regenerate. No new ones are created to take the place of those destroyed as a result of disease or injury or old age, as is the case for most of the other cells in the body. Since this is true, we might assume that the brain has a very small margin of safety. However, we seem to have a superfluity of brain tissue. Surgery for the removal of brain tumor has brought to light the fact that one or both of the two frontal lobes of the cerebrum may be completely removed without interfering with cerebral function. Even though important nerve centers in the brain or spinal cord may be destroyed, it is sometimes possible to educate adjacent centers or to arouse dormant centers to take up the work of the lost ones. For example, when groups of motor nerve cells in the spinal cord have been destroyed by the virus of poliomyelitis, new connections between adjacent centers and the muscles affected may be established.

Factors of Safety in Unpaired Organs. In the case of unpaired organs we often find an even greater amount of surplus tissue than in paired organs. The internal secretion, insulin, which is manufactured by clusters of cells embedded in the pancreas, is required for the utilization of sugar by the body. Complete removal of the pancreas in experimental animals results at once in extreme diabetes. Yet if only one fifth of the normal pancreas is left, enough insulin is produced to supply