

being augmented if the carbon dioxide tension in the blood increases, and depressed as that tension falls. The rate of the heart and the blood pressure also are each determined by the other. With high tension the rate is slowed, while a fall of pressure increases the rate, the adjustment being made through the central nervous system. This is most interestingly seen in the high tension and slowed pulse which accompany increased intracranial pressure as in depressed fracture or subdural hemorrhage. Nature is seeking by the increase of pressure to maintain the nutrition of the compressed portion of the brain tissue, which, as is well known, like all other nervous tissue, is extremely sensitive to deprivation of its nutriment, the high tension being thus Nature's attempt to ward off the impending disaster.

Still another example showing how gradually a normal circle may be perverted and shade off into a vicious one is the arrest of intestinal movement and the abdominal rigidity by which Nature seeks to check the spread of peritoneal infection. The intestinal stagnation and putrefaction thus induced adds to the toxemia which is putting the life into jeopardy.

We may now perhaps, having at least partially cleared the ground and opened up the way, proceed to discuss vicious circles, and in this discussion I wish at the outset to disclaim any great originality, and to acknowledge my obligations to a series of papers on this subject published within the last few years in the *British Medical Journal* and the *Lancet* by Dr. J. B. Hurry, of Reading, England. He defines the term, vicious circle, as "A morbid condition in which cause and effect are so correlated that cause becomes effect and effect becomes cause."

We must exclude from our definition spurious circles in which there is no reciprocal action between cause and effect, such as congenital malformation of the heart, in which the arterial and venous systems communicate direct, or the short circuiting occasionally seen after a gastroenterostomy when the contents of the stomach on passing through the artificial opening instead of going on down the intestine, are carried back through the short loop into the stomach again.

As I have already said, the vicious circle is often one of Nature's good circles gone wrong, or a failure of one of Nature's attempts at compensation. The recognition of these vicious circles is frequently difficult. Practice in the detection of them is certainly a profitable exercise, training one's habits of observation and increasing one's clinical acumen.

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