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Book Review

Swapan Kumar Adhikari, *The Role of Mathematics on Human Structure*, 35/1 Krishnataran Naskar Lane, Ghusuri, 711 107 Howrah, West Bengal, India: Dipali Publications, 2003 (156 pages). E-mail: dipalipub@yahoo.co.in/dipalipub@rediffmail.com. ISBN 81 901643 0 9. Price: US$ 10.95 (international); Rs 550 (India)

Health care is getting more and more technical day by day. Medical doctors are being dependent on evidence based medicine due to various reasons. Empirical and intuitional judgments have taken a back seat. Technicality requires mathematical precision. Swapan Kumar Adhikari's book: *The Role of Mathematics on Human Structure* is an attempt to gauge human skeletal and joints from a mathematician's point of view. He has started from the days of grand old mathematicians like Leonardo da Vinci and René Descartes. Physiology and Mathematics have traveled a long path since those days. Modern orthopedic surgeons are very much dependent on the Anthropometry and Physiological data of high precision. Biotechnology is advancing very fast. We are looking forward for further technical nitty-gritty and latest technical advances in the future addition of his book. Such an interdisciplinary work is difficult to assess both from the standpoint of a medical doctor and a mathematician but such an attempt will open up new vista for the young enthusiasts.

It is interesting to note that the basic architectural design of the Gothic-Arch is found in the trochanteric fibers of human femur. Weakest point of neck of the femur lies just below it. Elderly people commonly break their leg at this point due to fall. Movements of big joints and limbs are analyzed in geometrical precision. Haversian system of bone structure is a superb creation of nature which can tolerate more load than any other inorganic material. The force distribution through the joints and long bones has been analyzed from a mathematician's view point.

Histopathological structure of the human body exhibit many mathematical models. In page 97 of his book, he has analyzed how the force active at the iliac-crest forms conical helices and incidental study of spirals by Archimedes and Canon make an interesting reading. The head down curve of the human fetus in mother's womb opens up as sinuous curve with the growing child following Euler's law of bending. Some joints of the body are more mobile than stable. The shoulder is such a joint. Ergonomically disease states bloom into painful diseases due to repeated violation of simple laws of ergonomics and kinesiology.

Medical doctors shy away from mathematics. Modern science has given them various electronic and mechanical instruments which need some mathematical expertise to handle them properly. The author believes that nothing can be called scientific unless it admits mathematical deductions.

The chapters of this book have been arranged under the following titles: Leonardo da Vinci – the anatomist of great ability; physiological concepts of René Descartes; mathematical explanation of Descartes' concept of pineal gland and its modern view; mechanism of movement of heart – on mathematical concepts; cervical deformations – its causes and its deductions on mathematical basis; mechanism of skeletal shoulder-joint – analyzed by mathematical process; vertebrae and its efficiencies – expressed in mathematical procedure; pelvis – distribution for forces through it by mathematical deductions; human femur and mathematical examination; structure of femoral condyles distributing weight to the lower part of the leg; structure of bone lamellae and distribution of forces on the hip-joint; role of ligaments on the movements of femur in comparison with hip and its mathematical examination.

In this book there is a little touch of psycho-pathology. Can human sufferings be measured by mathematics? Artificial intelligence is beyond comprehension even today. Will mathematics be able to remove the unpleasant feelings from the human mind?

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