

we therefore study and finally master the science of acoustics. Botany is one of the tributary sciences of medicine, and was created for its purposes in order that the vegetable kingdom might be forced to render up such substances as it possessed capable of being utilized in the treatment of disease. In order that man's true place in creation and his relation to the animal kingdom might be established so that the structure and functions of the various parts of his body might be comprehended, the great science of comparative zoology was instituted, and the development hypothesis, that vast and magnificent scientific structure built up within the present century by the labors of Lamarck, Isidore Geoffrey Saint Hilaire, Wallace, Darwin, Lyell, Huxley, Haeckel, and Herbert Spencer, may be properly looked upon as a mere outgrowth of the science of medicine.

When we look at the subject more deeply and consider it more profoundly, the above are seen to be comparatively trivial instances. We discover that man, standing, as he does, in nature and as part of nature, and also at the summit of and, in a sense, above nature, all the rest of nature is tributary to him and leads up to him; that therefore the right understanding of man involves and supposes the right understanding of much that is not man.

It will be interesting and perhaps instructive to follow this proposition into some detail, and in order to do so I propose to show how a number of ascending lines, starting from the various departments of lower nature, converge toward and at last meet in that miracle of elaborate organization, the human body. These lines or series may be designated as, first, the Morphological Series; second, the Histological Series; third, the Chemical Series; fourth, the Dynamical Series; and fifth, the Psychological Series.

(1) The Morphological Series is the term used to designate the ascending sequence of forms which passes in an unbroken order from the lowest animals up to man. No member or organ in the human body can be fully understood until it has been traced throughout this series. For the various members and organs of the human body were not originally created as they exist in that body, but have each one of them a long history, stretching far back into prehuman times.

As in the case of the separate organs, so in the case of the entire individual. The study of man, which has been forced upon us by the dread of disease and death, has gradually opened our eyes to the fact that there is an intimate relationship between ourselves and other animals who occupy a lower place in the scale of creation than we do. We have learned that every organ in man, down to the most minute, is tallied by a similar organ in any one of the higher animals that we may choose to select and examine; and that any organ which exists in any one of the higher animals will be found in man also if it be looked for. Even, strange to say, in cases where man has no use for the organ, still he has it. For instance: Man's external ear is motionless; he has, therefore, no use for the muscles with which the lower animals move their ears, but for all that he has them. Again: All the apes use their feet, as well as their hands, to grasp with; they can all use the great toe as we use the thumb, that is, they can oppose it to the other toes and seize and hold sticks, nuts, or other things, between the great toe and little toes, just as they or we can seize and hold small articles between the thumb and fingers. We have no such power; we cannot make use of our toes in this way; still every muscle which exists in the foot of the ape by means of which he executes the movements in question exists also in our feet, but we make no use of them, and can make no use of them. Did we ever make use of these muscles? If so, when? If we never used them, why were they placed in our feet? Why should dozens of muscles be made and carefully placed and connected in our feet for no purpose? The muscles in question are now greatly atrophied for want of exercise. Were they created in this atrophied state, or were they created to be used, and have they since shrunk for want of exercise? Another instance: Cattle, horses, and many other of the lower animals, have a broad, flat muscle just under the skin of their neck and shoulders (a part of the body to which their tails will not reach), by means of which they shake the skin covering these parts and so drive away flies which have settled there. We also have that muscle in our bodies; it is called the *platysma myoides*, but we have no use for it, and could not use it if we wanted to do so,