

AN  
INAUGURAL DISSERTATION

ON

*Comparative Anatomy;*

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## Comparative Anatomy:

All the laws of nature are perfect and worthy of our profoundest study, and claims our highest admiration. But nowhere do we witness an exemplification, and comprehend her immutable laws in a more forcible beautiful and instructive manner, than when we consider the successive development in regular gradation of animals from the lowest class to the human species. I say beautiful because of the harmony and wisdom so brilliantly manifested therein; I say instructive because we can and do deduce interesting facts of an indubitable character therefrom that are not enabled to be obtained from any other source.

## Comparative Anatomy

The organism of man as a self moving machine is an object of wonder and source of astonishment, even to himself. For there is such a vast number of organs and such a complexity of functions to be performed and such a mutual dependence of the organs upon each other, and correlation of functions that he truly seems to be a "harp with a thousand strings" and to assign to each organ its proper function, or set of functions, would indeed be quite a difficult task. We might stand and gaze upon a man forever and know nothing of his physiology, we may see both his voluntary and involuntary

movements and comprehend them  
not; we might even perform those  
motions ourselves without  
knowing whence originated the  
power or incentive to perform  
it. We might see without  
understanding <sup>or</sup> knowing what  
was necessary to produce the  
phenomena of vision, hear, taste,  
and smell without knowing  
by what power it <sup>was</sup> performed;  
and since we can gain compara-  
tively nothing towards solving  
these questions by simple  
observation on the living subject,  
(and all experiments are here  
precluded), so like wise we find  
ourselves equally puzzled in  
examinations on the dead subject.

But nature here presents us with  
experiments already prepared in  
her great laboratory and adapted  
to meet our precise purposes  
by exhibiting to us a chain  
of beings from man of  
continually decreasing comple-  
xity of organization until  
we arrive at some in which  
any given function is executed  
in its very simplest manner;  
Or to ascend from this point  
we notice the successive super-  
additions to each organ or  
apparatus of organs, and by  
comparing these with the habits  
sphere of life and other  
peculiarities of the beings which  
exhibit them we learn by an

easy induction the uses or functions of the numerous superadditions which we find in most of the human organs as compared with the simplest and most elementary state of the same organs in the lowest animals.

The truths taught by Comparative Anatomy are not only interesting to the physiologist alone who thus wishes to draw his inductions therefrom but it is also replete with interest to all in consequence of the many curious and peculiarly interesting facts it unfolds, showing for instance the near relationship one class of animals sustain to another.

and regular gradation in  
their successive developments.

Let us take for example the nervous  
system as this is generally the basis  
of classification and notice  
briefly the consecutive the consecu-  
-tive grades from the lowest  
animal up to man; indeed we  
find a large class so low in  
in the grade of development as  
not to have any nervous system.  
Thus just merging beyond the  
vegetable in an almost  
inextinguishable degree we find  
the class of Protozoa perfectly  
motionless by any voluntary  
efforts of its own, but carried  
by the motions of the wave  
in which <sup>they</sup> live and only regarded

animals in consequence of  
their analog of structure. Ascending  
a little higher we come next  
to the Radiata a class characterised  
by the merest rudiments of a  
nervous system viz by a very few  
minute nerve fibres arranged  
circularly around their mouth.

They are selfmoving animals  
and it is in this class that  
we first notice organs of digestion  
in the form of a tube and in  
some of its species blood vessels  
begin to appear as mere  
continuations of the alimentary  
canal. One step higher  
and we notice that class  
termed Mollusca in which  
there may be detected minute



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ganglia of nerves dispersed in various portions of its body. Along and convoluted intestinal tube, a distinct liver and large heart in which is exhibited very beautifully the simple process of circulation. But leaving this we next come to the Articulata which have nervous ganglia arranged symmetrically along in each segment; such are some of the worms and in some of the higher species of this class there is developed a double ganglia that is, all the ganglia are on the ventral or under side of the animal but the first or anterior segment

which has its ganglia in the upper portion above the esophagus; and here we see manifested the earliest and first rudiments of a brain. Insects of various kinds belong to this class. But it is not till we come to the next class that we see ourselves so nearly typified. The next in order is the class Arthropoda. These have a vertebral column arranged in distinct segments and a spinal-axis which is a continuation of nervous matter throughout the entire length of the spinal column swelling out at its anterior extremity and designated as

the brain; Now according to  
this classification we observe  
a great many species included  
under the same head, within  
the same class, thus for instance  
we ourselves are classed with the  
serpent, the fish, the dog, the  
horse &c. and why not since  
in anatomical structure as well  
as in the arrangement of the  
nervous system we see our own  
skeleton pictured in that of  
the beast and daguerre-typed  
in that of the bird. Yet there  
is a principle within us that  
separates us widely from the most  
anthropoid beast. Between these  
classes, the<sup>n</sup> which we have designated  
there are all grades which may be

divided and subdivided, <sup>now</sup>  
although we are enabled to com-  
-mence at the lowest and ascend  
step by step by almost imperceptible  
gradations up to man. Still I am  
not one of those who, influenced  
by the strange hypotheses taught in  
in the doctrines of Andrew J. Davis,  
pride themselves in the name  
of progressionist and assume  
that by continual progression  
towards a higher stage of development  
that the vegetable kingdom  
springing from the mineral and  
by the same progressive law  
they maintain, the lowest animal  
spring from the highest developed  
vegetable, and thus one species  
of animals merged into that

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of a higher order until man  
himself was finally developed  
from this futile source. I am  
far from subscribing to such  
a doctrine as that so far from  
it that I believe in an entire  
and distinct unity of each species.  
There are it is true many apparent  
aberrations from any given type  
of a species, which renders it  
somewhat difficult to draw  
a line of demarcation  
around each species, but we  
define a species to embrace all  
~~the~~ that sprang from a common  
parentage and are capable  
of propagation into each other,  
and these maintain that  
there never could be a mingling

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of different species by facts suffi-  
ciently conclusive to overthrow  
the position of the Progressivist.  
We find every variety belonging  
to the same species no matter  
how many have the same  
anatomical structure, only  
as it is modified by habit, &c.  
and a stronger evidence is the  
physiological peculiarities of  
each species, that no hybrid is  
capable of propagation, and  
thereby setting up a new species,  
all each one observes a law  
peculiar to themselves in  
regard to the vital functions,  
as periods and duration of life,  
the economy of the sexes and  
phenomena of parturition & reproduction.

But it is not my intention to  
pursue or investigate those specu-  
lative theories in this short dissertation  
but leave them for Physiologists  
to discuss in their octavos.

In every class of animals  
from the Monad to man  
there is a perfect adaptation  
of organs harmoniously  
corresponding with the mode  
of life and requirements  
of the animals possessing them.  
Thus those animals that live  
under water have no use for  
air breathing lungs and  
consequently have none.  
The amphibious tribe breathe  
both air and live in water  
and hence have organs to

subserve this double purpose.  
 The Carniverous have apparatuses  
 of prehension, The herbivorous  
 have teeth adapted to meet  
 all their conveniences, Whenever  
 we observe an exceeding acuteness  
 in any one of the senses  
 we note a corresponding develop-  
 ment of the special ganglia  
 supplying that part, and this  
 is of peculiar interest to the  
 physiologist in assigning  
 functions &c. for instance if  
 an animal be notable for  
 seeing well the <sup>ie. the bacula of the</sup> optic ganglia  
 will be well developed, if  
 for hearing the auditory, for  
 smelling the olfactory, for  
 tasting the gustatory, &c. too



with the cerebellum which  
 is now I believe, pretty generally  
 conceded to be the organ whose  
 function is to coordinate or  
 combine the powers of locomotion  
 instead of as is sometimes  
 maintained the seat of sexual  
 propensities, consequently in  
 those requiring the greatest  
 amount of motion and activity  
 it is largely developed so likewise  
 with the cerebrum the centre  
 of the intellectual faculties  
 at least it has been tolerably  
 well established the capacity  
 of intellect is in proportion  
 to the amount of surface of  
 the cerebral matter covering  
 the cerebral hemispheres.

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It is in the development of these intellectual faculties that we notice the most material and marked difference between man and beast, it is in this that he can boast and proudly boast of being lord of creation.

The skull not being capacious enough to afford sufficient extent of surface we find the brain convoluted upon itself in order to economize space.

I am not disposed to moralize yet it does look to me that we should cease to wonder at his being an accountable being when we reflect upon the transcendently elevated position he sustains in regard to the

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remaining portion of the animal  
kingdom, that he being the  
finest the culmination of perfection  
almost itself, yea the image of  
God no wonder he is endowed  
with an immortal principle.

"Monarch of all he can  
survey" the only wonder is that  
he does not more highly appreciate  
his high and noble station.