

M0001172: Origins of disease: framed display board

Publication/Creation

15 August 1930

Persistent URL

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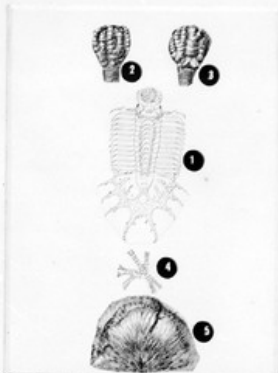
PALAEONTOLOGICAL EVIDENCES OF DISEASE

PALAEONTOLOGICAL DATA AND CONSIDERABLE INFORMATION TO

THE STUDY OF THE ANTIQUITY OF DISEASE, THE CAUSES OF DISEASE OR INJURY AMONG ANCIENT ANIMALS MAY BE GROUPED UNDER THE FOLLOWING HEADINGS.

- (1) MECHANICAL INJURIES THROUGH NATURAL CAUSES, SUCH AS CRUSHING OR BREAKING OF BONES, SHELLS OR TESTES BY WAVE SHOCK OR IMPACT IN FALLING.
- (2) INJURIES CAUSED BY PREDATORY ANIMALS IN WATER AND ON LAND, SUCH AS CHAM, CEPHALOPODS, SHARKS, AND CARCINOUS MAMMALS. SUCH EVIDENCES ARE COMMONLY SEEN IN OSTEOLOGICAL REPTILES.
- (3) PARASITIC LESIONS CAUSED BY THE PRESENCE OF WORMS, SPONGES, CORALS, ALGAE OR OTHER ORGANISMS WHICH BECAME ATTACHED ON OR BORE INTO SHELLS OF LIVING ANIMALS OR THE UNPROTECTED COLUMNS OF CHONDRO. SUCH LESIONS FURNISH OUR EARLIEST EVIDENCES OF PATHOLOGY. THIS TYPE OF INJURY IS COMMONLY SEEN IN THE IRREGULARLY THICKENED WALLS OF OYSTER SHELLS WHICH HAVE BEEN ATTACKED BY SPONGES.
- (4) BACTERIAL DISEASES INDICATED IN BONY TISSUES, DECAYED TEETH, NEGROTTIC FOOT OF BONY KING SEEN IN VERTEBRATES. BACTERIAL DISEASES OF FOSSIL PLANTS AND LESIONS PRODUCED BY FUNGI BELONG IN THIS CATEGORY.
- (5) PARTICULAR KIND OF PATHOLOGY IS CAUSED BY POISONING OF THE BONES WHICH THE ANIMALS LIVED. THIS MAY RESULT IN HYPEROSTOSES, ANOMALIES OF FORM OR A DEPRECIATED FORM.
- (6) A WEAKENED OR SENILE CONDITION SUPERVENED BY LOSS OF VIGOR APPARENT UPON GEOLOGICAL OLD AGE OF A RACE, BY WHICH THE MEMBERS HAVE BECOME UNABLE TO COPE WITH CHANGES IN THEIR ENVIRONMENT, WITH RESULTING DEGENERACY AND FINAL EXTINCTION. THE PRODUCTION OF SPINES IS OFTEN AN INTERNAL MANIFESTATION OF GEOLOGICAL OLD AGE.

THERE SEEMS TO BE LITTLE POSSIBILITY, FROM A STUDY OF PALAEONTOLOGY, OF DETERMINING THE FUNDAMENTAL CAUSES OF DISEASE OTHER THAN IS ALREADY KNOWN; FOR DISEASE IS APPARENTLY ONE OF THE MANIFESTATIONS OF LIFE, AND HAS FOLLOWED THE SAME LINES OF EVOLUTION AND DEVELOPMENT AS HAVE PLANTS AND ANIMALS, AND HAS PROBABLY BEEN DICTATED BY THE SAME FACTORS. LIFE PROGRESSES IN THE PAST HAVE TAKEN PLACE IN THE SAME MANNER AS THEY DO TO-DAY, AND THERE IS NO REASON TO SUPPOSE THAT PATHOLOGICAL EVIDENCES WILL BE OF A DIFFERENT TYPE. THE STUDY OF THE LESIONS SO FAR KNOWN AMONG FOSSIL ANIMALS INDICATES NOTHING NEW IN THIS RESPECT; NOT SIMPLY EXTENDING OUR KNOWLEDGE OF PATHOLOGY TO A VASTLY EARLIER PERIOD THAN HAS PREVIOUSLY BEEN KNOWN.



PALAEONTOLOGICAL EXAMPLES OF PATHOLOGY.

1. A large (nearly two feet long) Paleozoic oyster *Tridacna grandis* shell, showing in the transverse section indications of partial ossification. (after Hall.)
2. Belemnite rostrum of a fossil belemnite, showing the stem nearly as large as the crown. The stem was broken off during life, leaving only infrabasal and one basal, the parts above those being replaced by a new growth producing an irregular crown with three rows, very unequal basal plates and four pedicels, two of which are solitary, thus giving six rays. (after Stryker.)
3. Right anterior view, showing old basal with distal faces still exposed. X 2. (after Stryker.)
4. Diagram showing form and arrangement of plates, infrabasal and basal.
5. Belemnite rostrum with fracture at the point of the apex. *Tridacna alternata* Belemnite.

THE ORIGIN OF DISEASE

DISEASE DOUBTLESS BEGAN WITH THE INCEPTION OF ANTIQUITY

BETWEEN TWO FORMS OF LIFE, AND THIS MAY HAVE OCCURRED AS EARLY AS THE ANCHORAGES AND DISEASE THIS IS AS OLD AS LIFE ITSELF. THE EVIDENCES THIS FAR SEEN POINT TO A DEFINITE ANTIQUITY ONLY LATE IN THE PALAEOLITHIC. IF THIS IS TRUE THE EARLY PATHOS WERE FREE OF DISEASE. PROTOZOIC BEGINS, WITHOUT DOUBT, VERY EARLY IN THE HISTORY OF ANIMAL LIFE. IT IS PROBABLE THAT THE NATURAL IMMUNITY OF THE EARLY ANIMALS WAS SUFFICIENTLY SOUND TO RESIST THE INVASION BY ANY PATHOLOGIC ORGANISM IN SUFFICIENT NUMBER TO PRODUCE DISEASE. THE BREAKING DOWN OF THIS IMMUNITY MAY POSSIBLY BE CORRELATED WITH THE DEVELOPMENT OF CONSCIENCE AMONG THE EARLY RACES OF ANIMALS, WHICH REACHED A CLIMAX IN THE TRILOBITE AT ABOUT THE TIME WE FIND THE EARLY INDICATIONS OF DISEASE AMONG FOSSIL ANIMALS. THE BREAKING DOWN OF THE IMMUNITY, DUE TO THE DEVELOPMENT OF FREE CONSCIENCE AND THE INFLUENCE OF DISEASE, DROUGHT WAS OF GREAT IMPORTANCE IN THE EXTINCTION OF THE TRILOBITES, AND OTHER GREAT GROUPS OF ANIMALS WHICH HAVE DISAPPEARED FROM THE EARTH.

THE EVIDENCES OF DISEASE IN PAST GEOLOGICAL TIME ARE NOT CONFINED TO THESE RACES OF ANIMALS WHICH SHOWED CONSCIENCE. PALAEONTOLOGICAL INDICATIONS OF CONSCIENCE AND THE IMMUNITY IN THEM, ON THE CONTRARY, THE LOSS OF FACIAL VISION, AN INTERNAL MANIFESTATION OFTEN BEING SEEN IN THE PRODUCTION OF APPARENTLY UNLACED SPINES AS EVIDENCED IN MANY RACES OF ANIMALS WHICH HAD BECOME REDUCED OR EXTINCT, SUCH AS THE CHONDRO, TRIDACTYLITES, BRACHIOPODS, ANCHORAGES AND OTHER REPTILES THE FOSSIL FORMS AND THE DISEASES, MANY OF WHICH CAUSED DISEASE FORMS. IT WOULD SEEM THAT THE RELATION BETWEEN DISEASE IN ANCIENT TIMES AND THE EXTINCTION OF GREAT GROUPS OF ANIMALS LIKE THE DINDACTYLITES WAS A MATTER OF KINDS IMPORTANCE. THE INDICATIONS OF DISEASE DO FAR MORE OF ANCIENT BEINGS ARE THE RESULT OF ACCIDENTS, OR OF KINDS CONSTITUTIONAL DISTURBANCES WHICH DID NOT ENDANGER THE LIFE OF THE RACE, AND SELDOM THAT OF THE INDIVIDUAL. THE EVIDENCE IS SCANTY, BEING CONFINED TO THAT SEEN ON THE HARD PARTS OF ANCIENT ANIMALS, NOT ON A SIMILAR BASIS IS LOCATED OUR PRESENT EXTENSIVE KNOWLEDGE OF THE EVOLUTION OF ANIMALS IN PAST TIME. MANY OF THE EPIDEMIC DISEASES OF TO-DAY, WHICH ARE SO FATAL TO LIFE, LEAVE NO TRACES ON THE BONES. IT MAY HAVE BEEN SO IN PAST TIMES, TO A GREAT EXTENT.