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The Canine Teeth---
Normal Functional Relation of the Natural Teeth of Man (continued)

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Mechanics Of Mastication: Resolution Of Opposing Forces

Now that we have examined evidence in physical Anthropology which casts a cloud over present accepted theories, let us concern ourselves with evidence in the science of physics. The accepted theory of normal occlusion likewise presents problems in mechanics for which nature has not made provisions to compensate in the periodontium. During the act of mastication the teeth and their supporting structures are subjected to certain forces. The main force in bringing the mandibular teeth in contact with the maxillary is supplied by the Temporal and Masseter muscles. This applied force is in the vertical direction and parallel with the long axis of the teeth, that is, if the mandible is closed vertically and not at an angle. In this favorable vertical direction, the contact of the opposing teeth developes two equal forces opposing each other (action and reaction). When the two opposing forces are parallel with the long axis of the teeth, each force equalizes the other and results in a static state. The entire periodontium supporting the opposing teeth then represents the resistance force to the opposing or applied force. With both forces in equilibrium and in a static state, the only movement of the opposing teeth would be in a vertical direction. This is the line of force that the supporting hard and soft tissues can withstand most favorably.

As we observed during the early stages of evolution, man (noting the terrific development of the ramus) developed powerful Temporal and Masseter muscles. However, the study of function and its effect on the occlusal surfaces of the premolars and molars, and incisal edges of incisors and canines (attrition) would also indicate that primitive man also possessed well developed Internal and External Pterygoid muscles for the horizontal and forward movement of the mandible. Man today still has the tendency to move the mandible in a horizontal direction, and if the horizontal movement is not limited and controlled by the canines, the result will be the development of kinetic forces which will cause a rotational movement of the teeth affected toward areas of lesser resistance.

In sketches shown in figure 58 and 59 I have tried to interpret the action and reaction of the applied forces, when the opposing teeth are in centric and in a static state and also in eccentric, the position accepted as being normal by those advocating the balanced occlusion theory. For easier interpretation of the action and reaction of the forces involved, the writer has confined his diagrams to the lower molar. However, the diagrams and resolution of the forces as shown on the lower also apply to the upper molar but in an opposite direction.

In Figure 58 the applied force F of the upper tooth is opposed by an equal force F as applied by the opposing lower tooth. The forces are equal and parallel with the long axis of the teeth. Consequently, the reciprocal or resistance forces R act along