the amount of load at that frame. The shear in figure 27 was computed in this manner.

(1) For instance, the load at station 0 is −1,000 pounds. Then the shear between stations 0 and 10 equals −1,000 pounds. At station 10 the load is +2,000 pounds. Hence the shear between stations 10 and 20 is −1,000 pounds +2,000 pounds, or +1,000 pounds.

(2) For an airship in static equilibrium, when centers of buoyancy and gravity are vertically disposed, areas under the shear curve must add algebraically to zero. This should be checked before proceeding to computation of bending moments.

f. For calculation of bending moments, all loads between ends of the airship and any frame are considered as supported by cantilever action from that frame. In the case illustrated by figure 27 starting at station 0, the bending moment for—

(1) Station 0=0.

(2) Station 10=−1,000×10=−10,000 meter-pounds.

(3) Station 20=(−1,000×20)+(2,000×10)=0.

g. An easier method of computing bending moments is to sum up the areas under the shear curve. Thus in figure 27, for station 20, the bending moment=10,000−10,000=0. For an airship in static equilibrium, when the center of gravity is vertically below the center of buoyancy, the bending moment curve returns to zero at both ends of the airship, since the summations of positive and negative areas under the shear curve are numerically equal.

h. Table IV, extracted from "Airship Design," by C. P. Burgess, of the Bureau of Aeronautics, United States Navy, shows loads, shear, and bending moments on the *ZR-1*, computed in accordance with the method described therein.

i. In computing aerodynamic loads, shear, and bending moments, a method somewhat similar to that described above is employed.

(1) Upturning dynamic forces on the hull are computed, using the Munk formula. This formula is omitted here as it involves mathematical computation beyond the scope of this manual. The forces so determined are distributed to the frames as concentrated loads.

(2) Excess static weight or buoyancy is then distributed to the frames in proportion to the cross-sectional area at the frames, unless known eccentric loading shows this distribution to be greatly in error.

(3) Dynamic force on surfaces is then distributed to proper frames. This force, as shown in paragraph 39*c*, is given by the relation—

$$F=(\text{Vol})\ v^2\frac{\rho}{2a}(k_2-k_1)\ \sin 2\theta$$