trical manner. In our modern text books the analytical method is mainly adopted, and it has seemed to me that the beauty and simplicity of the system have thereby been much overlooked. In following, and possibly simplifying by a more elementary geometry, Poinsot's course, we commence with the general reduction of a set of statical forces to a single resultant force and a single resultant couple.

1. Let P be one of a set of forces acting at assigned points of a rigid system, and let A be a point arbitrarily assumed as an origin. At A apply two opposite forces, each equal and parallel to P. Then the original force P is replaced by an equal and parallel force acting at A, and a couple. Each of the forces of the system may be treated in the same way, and the whole set will be replaced by a set of forces acting at A, (which may be combined into a single Resultant R), and a set of couples which may be combined into a single couple G.

2. Since R is compounded of a set of forces which are severally equal and parallel to those of the original set, R evidently remains the same in direction and magnitude, whatever origin be assumed; G in general varies for different origins in both respects, but evidently remains the same for all origins which lie in the direction of R.

3. To examine the changes which G undergoes in passing from one origin to another, let B be any other origin, and at B apply two opposite forces, each equal and parallel to R. We have then, R at B, the couple G, and the newly introduced couple Ra (a being the distance between the directions of R at A and R at B). Now suppose G to be resolved into two couples, whose axes are severally parallel and perpendicular to R; these will be, $G\cos\theta$, and $G\sin\theta$, where θ is the angle between R and the axis of G. Then the axis of the couple Ra being perpendicular to R, this couple will combine with $G\sin\theta$, but will not affect the other resolved part $G\cos\theta$. Hence, whatever origin be adopted, the resolved part $G\cos\theta$, whose axis is in direction of the resultant force, always remains the same. The other component of the couple admits of all values according to the origin adopted. We may therefore adopt an origin (or in fact a line of origins parallel to R) such that this other component shall be zero, and we have then remaining a couple whose axis is in the direction of the resultant force. In this case, the resultant couple evidently has its least possible value.

4. Calling G' this value of it, on transferring to another origin as in (3), the new couple will be compounded of G' and Ra, the axes of which are at right angles to each other; and the new couple