Mon-Angle.—An instrument having one angle only leading to the working point as in pluggers, or forming the blades as in excavators. Mon-angles form a large majority of excavators. In the greater angles only the shorter blades can be successfully used as mon-angles, for the reason that when the blade is long its inclination carries its working point laterally so far from the central line of the shaft as to render the instrument liable to turn in the hand when the edge is forcibly applied. This renders the instrument unsteady and ineffective. To remedy this defect, all cutting instruments, in which the angle and length of blades will carry the cutting edge more than three millimeters from the line of the central axis of the shaft, should be contra-angled.

Contra Angle.—The shank of the instrument is first bent backward (from the direction of the cutting edge), and nearer the cutting edge another bend is made forward—this length forming the blade, the object being to form a long blade, the edge of which will be near the central line of the shaft.

Binangle Contra Angle.—A contra angle formed by two angles as described under contra angle.

Triple Angle Centra Angle.—In an instrument of the angle of 12 centigrades or less (about 45 degrees)—the binangle contra angle will bring the cutting edge sufficiently near the central line of the shaft, and at the same time carry the shank sufficiently out of the way to permit the use of the full length of the blade; but instruments of a greater angle, a binangle would not do this, therefore a triple angle contra angle must be made; this is done by first bending the shank backward as in the binangle contra angle and then forming another angle which will bring the remainder of the shank parallel with the shaft; then passing forward a space of more or less length as may be required, another bend is made forward by which the blade is formed. In this way the cutting edge of a long blade is brought sufficiently near the central line of the shaft for effective work, and the shank carried sufficiently out of the way to permit the full use of the length of the blade.

Long blades that require contra-angling are mostly for use in places where a long reach of blade is necessary.

There are a number of other sub-class names that have been applied to excavators, but as none of them will be used they will be passed by for the present. Also, there are a number of sub-class names applied to plugger points, as cork screw, cow's horns, bayonet, etc., but as we shall not fully consider pluggers in this paper, they will also be passed.

Curves occur among the rights and lefts or double plane instruments for which no distinctive names have been developed. Those forms which I designate as spoons have a curve beginning at about one third the length of the blade and gradually increasing to the