eous deposition. The change from one deposition to another was probably gradual. A small proportion of the gold in the ore is native in the form of small grains and scales. The fact that oxidation extends only a few feet below the surface, while the proportion of metallics seem to average much the same even to ore shipments from the lower levels, sugests original deposition in this form. No data have been collected, however, to indicate whether it was contemporaneous with the pyrrhotite formation.

The average proportions of gold, silver, copper and total sulphides in a grade of, say, $15.00 full assay value are as follows:

	Average Centre Star Ore.	Average War Eagle Ore, Representing also Ore of No. 1, Josie, Le Roi.
Gold (oz.)	0.59	0.505
Silver (oz.)	0.43	1.0
Copper (per cent.)	1.12	1.78
Sulphide minerals (per cent.)	25.0	22.5

In various places the pyrrhotite seems to be accompanied by a little nickel and cobalt. Specimen analyses ranging from 0.13 to 0.65 per cent. nickel and from a trace to 0.59 per cent cobalt.

FAULTS.

These have an average direction which corresponds to the dike system, with dips ranging from vertical to 50 degrees easterly. Out of the great number of fractures studied and surveyed only the principal faults have been plotted, i.e., those fractures which appear to have affected the veins by well defined displacements or by acting as barriers to mineral solutions.

The faults are frequently not plainly marked, having no clay filling and at most only a small thickness of comminuted material. They frequently consist of a zone or series of close fractures, some of which are better marked than the others, and these fracture planes often interweave in such a manner that local measurements of their strike and dip are deceptive, and these can be determined only by comparison with other workings. As a general rule, the faults appear to have been too tightly compressed to give access to mineral solutions, and those existing during the deposition period have therefore tended to act as barriers to the flow of these solutions.

Since individual faults often cross dikes at sharp angles in strike and in dip, a fault frequently breaks along a dike for considerable distances. Hence in many cases of vein displacement it is impossible to say how much of the total amount has been due to the dike fracture, and how much to subsequent fault fractures accompanying it. In most cases where dikes are not accompanied by plainly marked fracture planes the displacement is so small as to indicate that the fault system and not the dike has probably been responsible for most of the shifting.

The sharp angles at which the faults cut the War Eagle vein have tended to produce overlaps of the vein.

The Josie and Centre Star-Le Roi vein, being crossed more squarely by the fault system, afford the best indications of its effects. The Josie dike, or more probably an undetermined fault acompanying this dike, have caused a displacement, which is indicated in the Josie and Number One vein to be a north throw going east. Proceeding east from fault to fault they are found to have the same throw up as the faults at the junction of the Le Roi-Centre Star territory, after which the steps occur in the other direction, with a throw to the south. Farther on a north throw is again encountered, and the steps are then south, north, north.

DISTRIBUTION OF ORE AND ORE SHOOTS.

The pyrrhotite mineralization has been very abundantly distributed through the larger veins, but the secondary disposition of gold and copper-bearing minerals has been more localized, occurring in the more favorable places. The bodies of valuable ore thus found are sometimes lenses, tapering out of the edges, and sometimes blocks terminating against faults or dikes. These ore bodies are found distributed within more limited portions of the vein area, which in the practical sense thus constitute the ore shoots, and indicate those portions of the area to which the gold and copper-bearing solutions had the best access. The shoots are upon a large scale and of such irregular form that their shape and limits have been developed very slowly, and the largest and best defined up to the present date are those of the War Eagle, Centre Star and Le Roi mines.

The War Eagle shoot has a dimension of 300 to 450 feet along the vein, and an almost perpendicular trend upon its plane. It is so located that its median roughly coincides with the line of the main shaft.

The Centre Star main shoot is located in the space between the shaft and the Le Roi end line, and appears to have a dimension of 300 to 500 feet along the vein, with a steep trend to the east. The Centre Star east ore shoot is several hundred feet east of the shaft, but has not yet been sufficiently developed to determine its length along the vein or its trend, although the latter now appears to be either perpendicular or very steep towards the east.

The Le Roi ore shoot on the 350-foot level stands near the east end of the claim, and descends perpendicularly, then assuming a westward trend. At a greater depth it stretches out so as to include the entire distance between the Josie dike and the fault of the Le Roi 700-foot level. The structure of the shoots and of the pay ore bodies within these shoots everywhere points to the conclusion that their location and shape are due entirely to the accidental conditions directing the upward flow of the mineral-bearing solutions.

The marked difference between the proportions of gold, silver and copper in the Centre Star ore shoots and those of the other mines suggests that the solu-