There's nothing constant in the universe,
All ebb and flow, and every shape that's born
Bears in its womb the seeds of change.

Ovid.
Metamorphoses, XV (A.D.8)
**CONCLUSIONS**

The different rock types present in the area, belonging to the Precambrian age group are the granitoids (the Chotanagpur granite gneiss, the Kana Pahar granite, the Burabazar granite), the metasedimentaries (phyllites and mica schists), the quartzite the amphibolites and amphibole schists, the microgranite-syenite body, the migmatites and the vein rocks.

All these rocks units show different entities in terms of geological events. The Chotanagpur granite gneisses are the products of repeated hybridization of early crustal rocks. In the absence of age data, it may not be possible to arrive at definite conclusion on the nature of the primeval crust. However, it is likely that the gneisses of tonalitic composition or plagioclase-biotite schist which are characteristically found in almost all the outcrops of rocks belonging to the granulite facies occurring within Chotanagpur plateau represent vestiges of an early formed crust. They have been derived from sediments that were compositionally similar to the greywackes or to volcanicogenic rocks. These ancient rocks must have undergone poly-metamorphism, migmatisation and anatexis, which make it impossible to establish the early magmatic and the depositional identity. The concepts of granulite facies metamorphism and anatexis have been borrowed here in terms of regional geology of the Chotanagpur plateau. The Kana Pahar granite, as well as the Burabazar granite body bear intrusive relationship with the gneissic body and the metasedimentaries. The metasedimentaries
comprising phyllites and mica schists, are exposed on the both sides of the fault zone. The quartzites form distinct ridges in the area and these ridges are well within the fault zone. The microgranite-syenite body is rather restricted in its occurrence and it bears an intrusive relationship with the phyllites. This body is a product of magmatic differentiation of the main granite mass. The amphibolites and amphibole schists are sill-like bodies within the phyllites and the Chotanagpur granite gneiss body. The migmatites occur mostly in the northern part of the area. The vein rocks, such as quartz-kyanite vein, quartz-tourmaline vein, etc., have affected the metasedimentaries to a large extent.

The major geological events that have taken place in the area are summarised as follows: Initial deposition of sediments was followed by metamorphic activity. The metamorphism was activated by the impulse of magmatic activities. The magmatic activity is supplemented by metasomatism and hydrothermal operation. The hydrothermal activity is not concomitant with the disjunctive movements producing the fault zone.

On the basis of findings in the present area the following conclusions are made:

a) The sub-metamorphics have a sedimentary parentage.
b) The general metamorphic trend has been confined within green schist facies condition of metamorphism, with occasional encroachment into the field of amphibolite facies condition of metamorphism.
c) The amphibolites of north and south-eastern section, tremolite-actinolite schists of southern part, metab doloreites and dolerites of northern zone are all actually basic-ultrabasic sill-like bodies, which have intruded into the metasedimentaries and the Chotanagpur granite gneisses in different stages and these were later subject to different degrees of metamorphism with a progressive rise from south to north.

d) Magmatic activities have been operative in the region producing Kana Pahar granite in the NW, Burabazar granite in the SE and micro-granite-syenite body in the central sectors. Migmatisation, Na-metaammatism, thermal metamorphism in the form of bleaching are the secondary manifestations of magmatism. Magmatic activities took place in successive stages and produced the Chotanagpur granite gneiss complex, by granitising the early crustal rock.

e) The magmatic fluid has supplied its end-stage fluid material in the form of hydrothermal solution, containing base metal ingredients, phosphates, bore-silicates, aluminous fraction and carbonates.

The advent of hydrothermal solution took place along the fault zone and its effects were controlled by the geochemical parameters of the lithounits i.e. the hydrothermal melt remobilised the materials already present within the lithounits, with a fresh supply of some ingredients and thus causing within the
enrichment of certain selective minerals in selective sectors. The type of selective mineralisation continues all throughout the fault zone.

The rock units are interrelated within the petrological model and their relationships with the phenomenon of mineralisation as a part of the petrological evolution are enlisted below:

i) The granite body has supplied the hydrothermal solution concerned;

ii) the mica schists have housed the kyanite crystals in the form of quartz-kyanite veins;

iii) the phyllites, intricately mixed up with brecciated apatite-magnetite-bearing rock and quartz-galena veins have acted as host rock for the apatite and base metal concentration.

iv) the bleaching of amphiboles in amphibole schists is the manifestation of granitic hydrothermal activity of micro-granite-syenite body, as well as the Burabazar granite body.

The cause of mineralisation may be explained in this way. The phosphatic material, present in the host rocks (phyllites of Beldih area) and also in the adjoining rock units, such as meta-basics in the form of apatite crystals (euhedral in nature) was later remobilised by the hydrothermal melt, and whenever suitable geochemical condition was attained, the enrichment took place.
Therefore, the initial sediments, compositionally similar to greywacks or to volcanogenic rocks were deposited in a basin representing the flysch-volcanic association at the very initial stage before attaining their metamorphic status. Later on, these sediments were metamorphosed to phyllites and mica schists. The Chotanagpur composite granite gneiss body at present represents the reactivated earliest rock unit in the area presently under investigation. The magmatic activity has taken place in certain stages at different places. While this magmatic activity has been active, the structural disturbance has taken place, following the general strike of the rock units and almost separating the Chotanagpur granite gneiss body from the rest of the rock units. During these operations, certain other geological events took place. A group of basic and ultrabasic sills, almost contemporaneous in their age, have emerged within the metasedimentary and also within the gneisses. The granitic melt has produced a bulk amount of hydrothermal melt as a fraction out of it. It has been visualized that the total quantum of hydrothermal melt was optimum, if not huge. This melt has been found to be invading the phyllites and mica schists having plenty of weak zone and housing the material at places, thus making selective concentration of minerals at selective spots. The granitic melt itself has produced migmatites, whereas the metabasics have suffered another degree of metamorphism and thus producing amphibolites and tremolite-actinolite schists typical of amphibolite and greenschist facies conditions of metamorphism.
So, in a nutshell, granitisation, shearing, hydrothermal activity, migmatisation, and metamorphism acted singly or concurrently, to affect the early crustal rocks to mark the petrological evolution of the Precambrians in the southern parts of Purulia district, West Bengal.