



pre-concentration of sample is a must. This variation of  $\pm 20\%$  is considered tolerable for geo-chemical surveys. The method has also been extended to the estimation of uranium in ppm ranges in granites and in USGS standard rock samples and the values obtained are within  $\pm 20\%$  (Table II). The sample solution is obtained by HF-HNO<sub>3</sub> treatment of the sample and the residue left is brought into solution with Na<sub>2</sub>O<sub>2</sub> fusion. The final solution has 10% HNO<sub>3</sub>.

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#### REFLECTED ARAVALLI TREND IN RUDRAPRAYAG AREA, CHAMOLI DISTRICT (U.P.)

THE Garhwal group rocks exposed around Rudraprayag (78° 59' : 30° 17' 5") in the Garhwal Himalaya, U.P., range in age from Middle Proterozoic to Middle Palaeozoic (Rawat<sup>1</sup>). The Garhwal Group consists of the Rudraprayag, Lameri and Chamoli Formations<sup>2</sup>, while the other two Gwanagarh and Patroli Formations<sup>2</sup> are not exposed around Rudraprayag. The basal Rudraprayag Formation is exposed northeast of Rudraprayag along the Alaknanda River Valley in the core of the shallow northeast plunging anticline (Kumar and Agarwal<sup>3</sup>). The Rudraprayag Formation with orthoquartzite at the base has large sized ripple marks and thin bands of black chert and slates on which the Lameri Formation with the basal part consisting of stromatolites bearing dolomitic limestone, then black pyritous slates and finally the massive dolomitic limestone, which is again overlain by the Chamoli Formation consisting of a sequence of orthoquartzite and penecon-temporaneous lava flows. The later epidiorites occur as sills and dykes in it (Fig. 1). The associated sedimentary structures in these formations indicate a normal sequence of rocks

from bottom to top with an unusual strike when compared with those in the Chail Nappe rocks (Valdiya<sup>4</sup>) or the Naini Group (Rawat and Varadarajan<sup>1</sup>) north of the Alaknanda thrust but earlier Kumar and Agarwal<sup>3</sup> referred to this as Alaknanda Fault. The evidences in support of its being a thrust are: there is a structural, lithological and metamorphic discordance in the rocks north and south of the Alaknanda Thrust. Moreover at places it is a low-angle and at other places a high-angle reverse fault with older rocks (Naini Group or Chail rocks) overriding the younger formations of the Garhwal Group (Rawat and Varadarajan<sup>1</sup>), exposed north of the Alaknanda Thrust (Rawat and Varadarajan<sup>5</sup>). The deformed and metamorphosed Naini Group shows a typical NW-SE Himalayan trend while the rocks south of the Alaknanda Thrust show NE-SW trend (Rawat<sup>1</sup>). The NE-SW trend is the trend of the Aravalli rocks in the Peninsular India. This type of trend is also reported by Pachauri<sup>6</sup> in the Calc-Zone of Purola in the Uttarkashi District. The Calc-Zone is equivalent of the autochthonous Deoban Group (Rupke<sup>7</sup>) or to the Lameri Formation of the present area. The basal Rudraprayag Formation of the Garhwal Group is best exposed in this place only. Auden<sup>8-9</sup> observed the Aravalli trend in the Himalaya at 10 localities such as at Andra (30° 36' : 77° 44') in the Jaunsar rocks which he said was due to the northward extension of the Peninsular India into the Himalaya between Chakrata and Nainital. Geodetic work has shown a region of high density continuing from Rajasthan into the Himalaya near Dehra Dun. Auden<sup>8</sup> noticed that no Aravalli trend is seen in rocks younger than the Blaini and that the Infra-Krol and Krol are unaffected by the Aravalli trend which cannot be later than the Upper Carboniferous in age. This might be taken as an evidence of pre-Himalayan deformation. The NE-SW orientation in this area is connected with the orogenic activity along the Aravalli axis in the Peninsular India. The rocks of the Garhwal Group that were deposited in a shallow marine environment, might represent the Aravalli ridge below it as a basement. Valdiya<sup>10</sup> is of the opinion that the transverse folds and faults present in the Himalaya might possibly be related to the hidden ridges and basement faults present below the Ganga alluvium, extending towards the Himalaya from the Peninsular India. It is quite possible that the NE-SW transverse folds-faults in the rocks affected by Himalayan orogenic cycle are the youngest which coincide in the present area with the earlier reflected Aravalli trend.

The area lies between two major tectonic planes the Alaknanda Thrust and the North Almora Thrust (Rawat<sup>1</sup>) and if we assume that the relative horizontal movements between these thrusts can also develop this type of NE-SW trend in the autochthonous