

DEPARTMENT OF MINES - SOUTH AUSTRALIA

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Petrography of the Canopus Bore - by N. Chebotarev.

The study of the Canopus Bore is based on the examination of the "washings" which were prepared for micro-paleontological purposes. The petrological examination of the samples has been done up to 641 feet only as was suggested by the paleontologist. Each sample was separated in bronophorm into a light and heavy fractions and examined under the microscope in the usual way. The results of microscopical examinations of minerals have been summarised in the form of table. Variation in mineral composition throughout the thickness of these sediments indicates the occurrence of different lithological facies in the sequence of these formations. Marked differentiation of the sediments of this bore may be traced as follows:-

0-174 feet. Quartz sand accumulations with magnetite, hemetite, limonite, ilmenite and leucoxene and rather small amounts of accessories (tourmaline, zircon and alusite, rutile, epidote etc.). The upper part of the formation (0'-120 feet) contains from 4 to 7 per cent of phosphatic material while the bottom portion is characterised by the presence of peculiar varieties of mineral tourmaline (dark blue coloured, brown and almost colourless).

174-285 feet. The sediments are associated with the high content of authigenic pyrite. It occurs in the form of egg-shaped grains or in the form of well outlined shell casts. Such pyrite is typical of impervious clay or shale sediments which have been laid down in marine environments.

285-522 feet. This horizon is notably different from the overlying sediments by the content of appreciable amounts of such minerals as aragonite which may be seen in the form of shell fragments and glauconite, the percentage of which ranges from traces up to 40-50 percent towards the bottom. The variations in the percentage of glauconite and aragonite, which sometimes attains about 80 percent of the fraction produce a basis for the further sub-division of this horizon - (depth - 285'-300';

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300'-310'; 340'-350') and may indicate alternations of clayey formations with shelly limestone.

522 - 536 feet. The beds are associated with the occurrence of which comprises 50-80 percent of the heavy fractions in some samples and a very considerable amount of glauconite (40-70%).

536 - 600 feet. This is comparatively abundant in the accessory minerals tourmaline, zircon, rutile, epidote group amphibole and so on.

600 - 641 feet. This contains a significant amount of siderite and fine aggregated siliceous material which may have organic derivation. As it can be seen from the above data a significant part of the sediments of Canopus Bore are of organic origin. The main formations were accumulated in a marine environment.

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