a) i) Earth has a magnetic field with poles positioned under the surface at the earth, slightly alset with the axis of rotation. Field lines cut the surface at angles and are only horisontal at the equator (or near it). When compared to a bar magnet as we know it, the south pole would exist at the ~~th~~ geographical north pole, as north ~~seek~~ poles on bar magnets point in this direction.

ii) According to the theory of plate techtonics the mid ocean ridge is a place ~~where~~ where new rock is formed and is regarded as the edge of two plates. as new rock is formed at the ridge the plates spread apart in opposite directions perpendicular to the ridge. ~~[redacted]~~ Also it is known that molten rock aligns

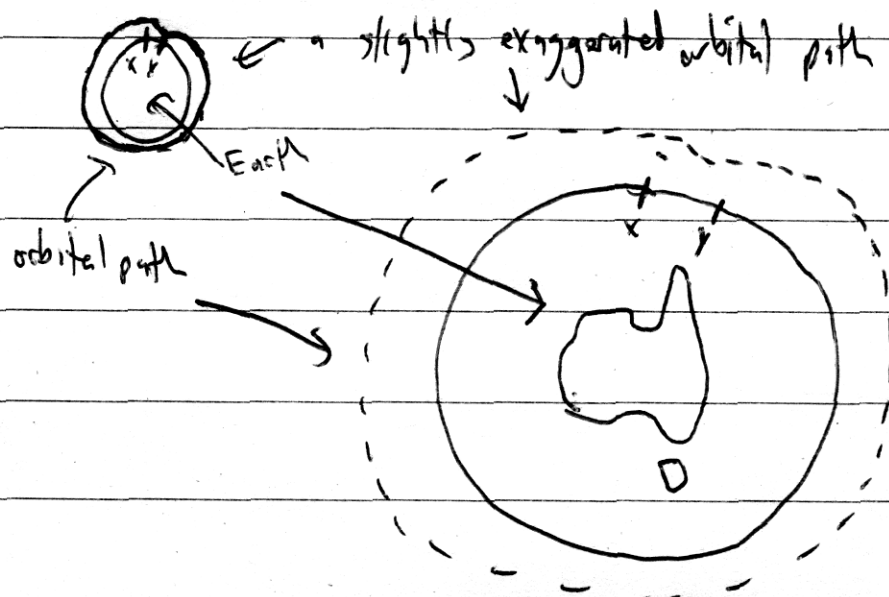
particles with the earths magnetic field at the time of creation, holding this magnetic field as it solidifies. ~~Therefore~~ It is also known that the earths magnetic field has reversed over time which would create new rocks at this time to have opposite magnetic fields. Therefore as new rock forms and takes on the magnetic orientation of the earth, it then spreads out in a symetrical fusion across the sea floor as the plates continue to move. These reasons account for the origin of the magnetic anomily on either side of the ridge.

BOARD OF STUDIES
NEW SOUTH WALES

[redacted]

b) i) X and Y are at equal heights at sea level but it can be seen that as the amount of water between a point and centre of mass increases, the gravity anomaly becomes closer maximising at a maximum water depth. This could be due to the increased density of the water (compared to land) in the Red Sea, renowned for its levels of salts, or a large scale structure beneath the depth shown - sedimentary basin or an isostatic structure are possibilities.

ii) As a satellite moves from west to east in an orbital path it will experience an increased gravitational force towards the Earth experiencing a slight dipping depending on intensity of anomaly towards the Earth

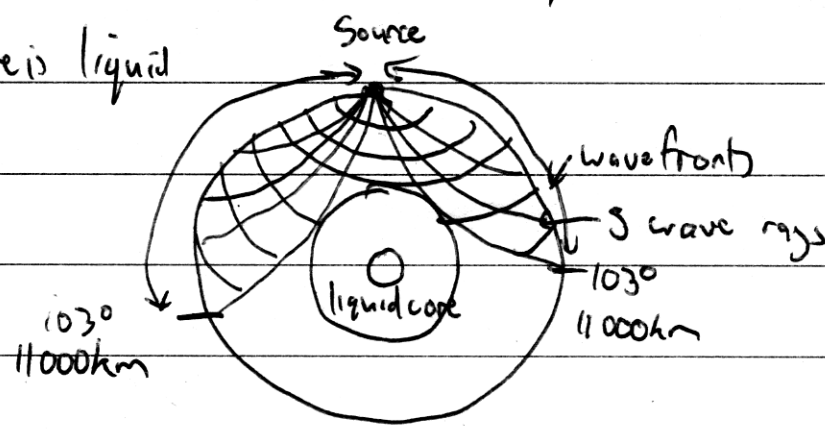


BOARD OF STUDIES
NEW SOUTH WALES

28 c) P waves are longitudinal and can travel through water. They increase velocity with shear and bulk modulus of the rocks. They are faster than S waves

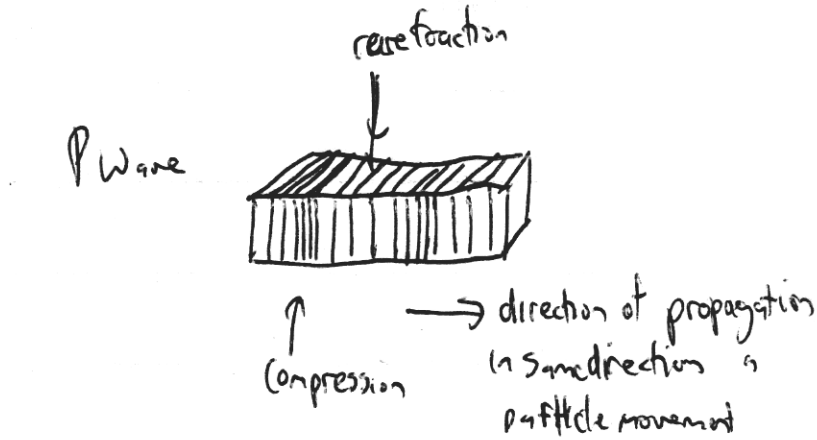
S waves or shearing waves are transverse and increase with shear modulus. Water having a shear modulus of 0 does not allow passage of S waves

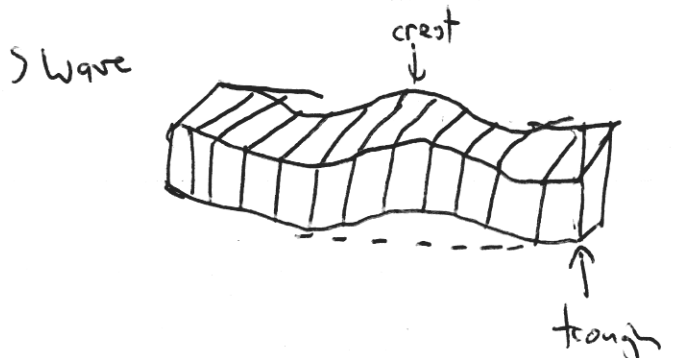
ii) ~~Because~~ It has been proposed that the reason for the S wave shadow zone of 10000 km from epicentre or 103°, is because ~~the Earth~~ part of Earth's core is liquid



As explained before liquid would not allow passage of S waves

iii) The graph supports evidence of a solid inner core in that P waves which are refracted through the Earth's core P'' arrive sooner than one that doesn't. P' But compressional waves slow down in ~~water~~ liquids therefore at some stage the P wave must have increased its velocity during its passage through the core. A very dense inner core would explain this difference in travel time and provide the extra velocity required.





Direction of particle movement
at right angles to wave propagation
direction

[illegible]

d) ✓ One Geophysical method used in mineral exploration is ~~seismicity~~ the seismic methods. There are a number of applications of seismic methods including seismic reflection

and seismic refraction. Seismic refraction is mainly used in locating ~~petroleum~~ fossil fuels buried beneath the earths crust. The information gathered ~~by~~ can help Geologists make a fairly accurate estimate of where fossil fuel deposits are located which ~~provide~~ saves a lot of money, as mining companies don't have to drill in ~~spots~~ viable spots to see if minerals are located there. ~~Seismic refraction can~~ Seismic reflection can help Geologists to find out what minerals are located in the subsurface. Geologists can use the information gathered ~~to~~ by geophones and seismometers to ~~a~~ create a map of the subsurface. Today, Geologists can take advantage of new supercomputer technology to process millions of peeces of information to make a 3d map of the subsurface. This allows Geologist to explore interactively

the subsurface and accurately locate different types of minerals beneath. Magnetic surveying and stratigraphy is another useful geophysical technique used in locating minerals.

Magnetic surveying and stratigraphy have been used in the exploration of minerals at the Murray Basin in Australia's South east. Low level flying magnetic serveys allow geologist to cover a wide area of land to locate possible mineral site at relatively low ~~a~~ ~~easy~~ costs. Magnetic ~~&~~ stratigraphy ~~is use +~~ ~~as~~ is undertaken by drilling into the earth an looking at the layers of the subsurface. This is used too to see the mineral content of the sand, and hence ~~the~~ Geologists can decide whether it is profitable to ~~dig~~ mine. This can save on a great deal of money.