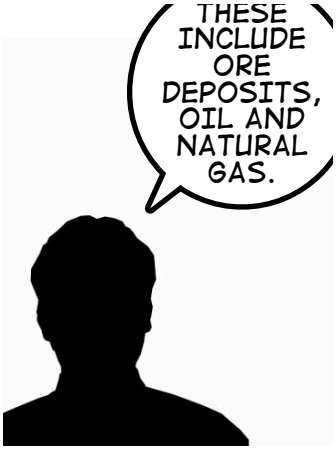
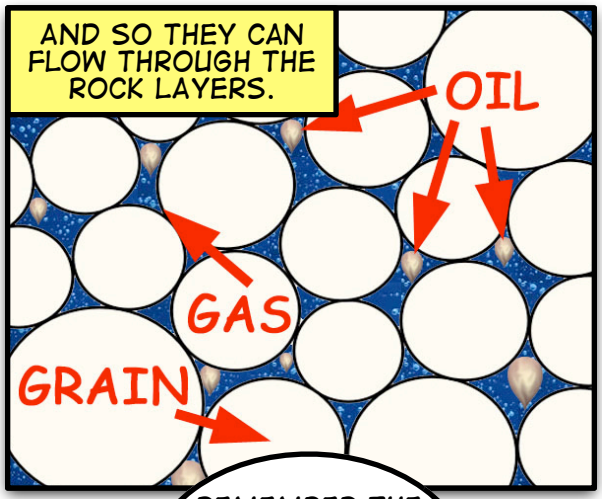

MOUNTAIN ZONES CAN BE AREAS THAT HOLD ECONOMIC RESOURCES.

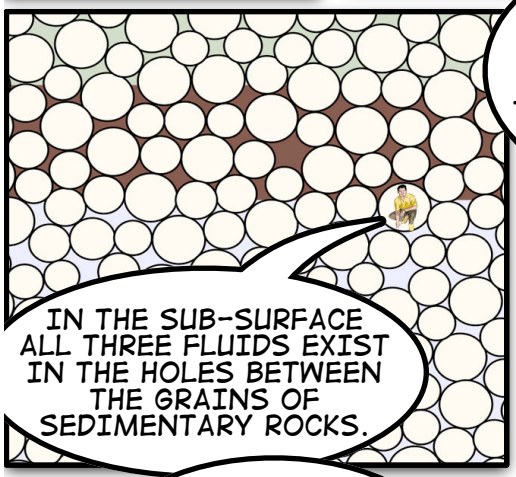


OIL AND NATURAL GAS CAN BE FOUND IN MANY PLACES, BUT THE STRUCTURES THAT EXIST IN MOUNTAINOUS AREAS ARE OFTEN PARTICULARLY SUITABLE FOR THEIR CONCENTRATION.

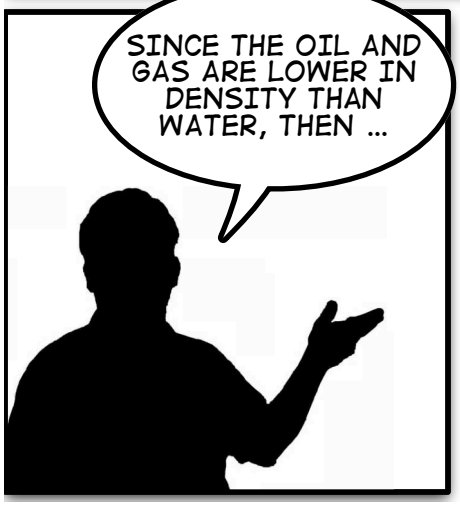
THIS IS BECAUSE OIL AND GAS ARE FLUIDS

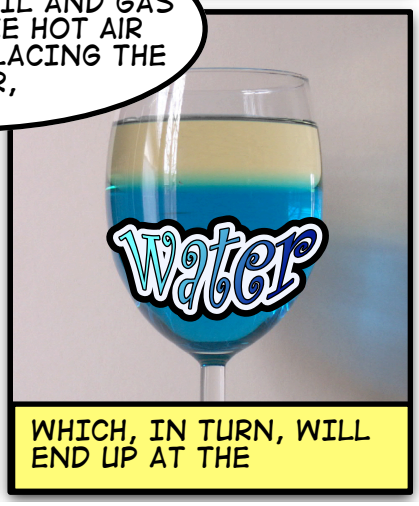


THE REASON THEY DO THIS IS VERY SIMPLE. OIL AND GAS ARE BOTH LESS DENSE THAN WATER.



IF THE PORES ARE CONNECTED TO ONE ANOTHER THEN FLUIDS CAN EASILY MOVE THROUGH THE ROCK. THIS PROPERTY IS CALLED PERMEABILITY.





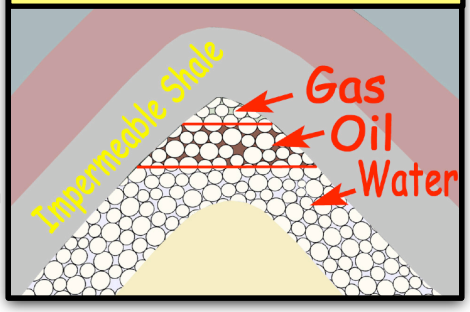
IF ALL ROCKS WERE AS PERMEABLE AS THIS SANDSTONE, THEN OIL WOULD ALWAYS END UP AT THE SURFACE,

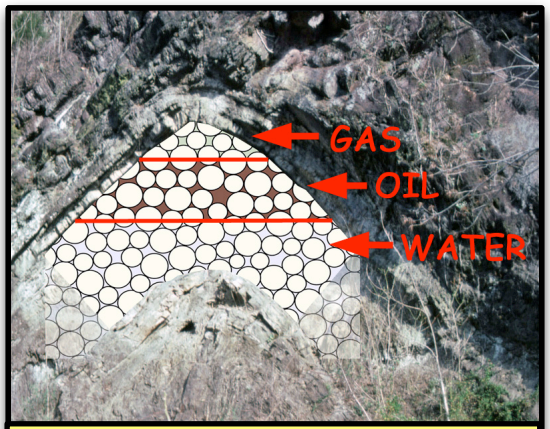
AND INDEED, THERE ARE PLACES WHERE OIL DOES SEEP FROM THE ROCKS.

BUT SOME ROCKS, LIKE THIS SHALE, ARE IMPERMEABLE.

IMPERMEABLE STRATA WILL BLOCK THE OIL AND KEEP IT FROM RISING.

WHEN THE ROCKS ARE FOLDED, THE RISING GAS AND OIL CAN GET TRAPPED AT THE TOP OF THE FOLD BENEATH AN IMPERMEABLE LAYER, LIKE SHALE.





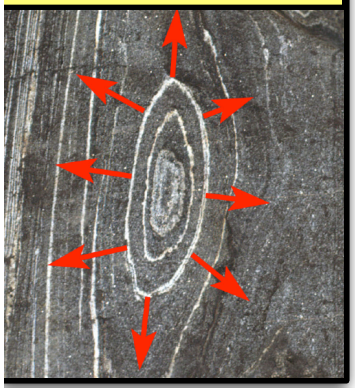
PRODUCING AN ANTICLINE TRAP.

ACTUALLY, WHAT I HAVE SAID SO FAR, IS A LITTLE TOO SIMPLE,

SINCE THE OIL COULD MOVE ALONG THE CREST OF THE FOLD, SO THE MOST EFFICIENT STRUCTURES TO TRAP OIL ARE ACTUALLY THOSE THAT HAVE A ***SINGLE*** HIGHEST POINT BENEATH THE IMPERMEABLE LAYER.

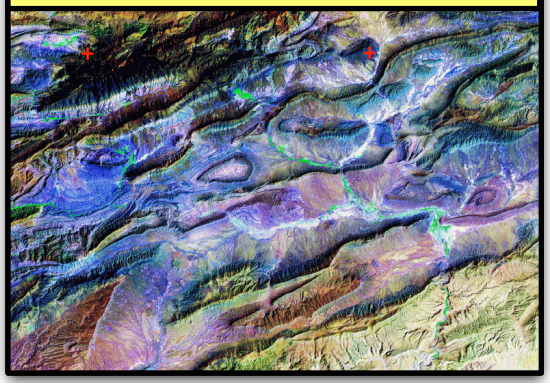
THESE ARE CALLED DOMES.

DOMES ARE SAID TO PLUNGE IN ALL DIRECTIONS.



DOMES CAN BE OF ANY SIZE, LIKE THESE SMALL ONES IN THE BANDED IRON FORMATION OF JASPER KNOB, MICHIGAN.

OR THESE ENORMOUS ONES IN A LANDSAT PICTURE OF THE ATLAS MOUNTAINS IN MORROCO.

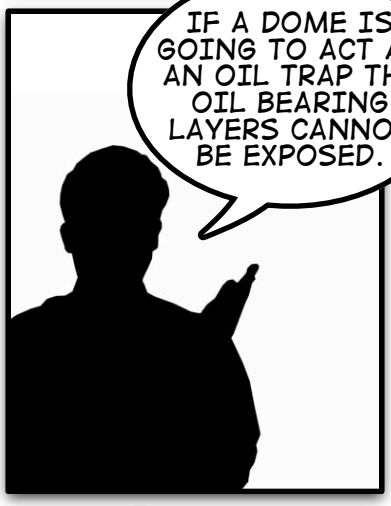


THIS IMAGE SHOWS DOMES IN THE ZAGROS MOUNTAINS IN IRAN, WHICH IS INDEED AN OIL FIELD.

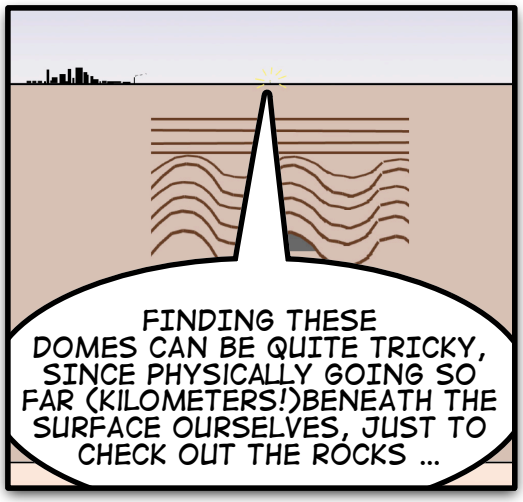
OF COURSE, IN BETWEEN THE DOMES ARE BASINS,

LIKE THIS ONE IN AUSTRALIA, SEEN FROM A LIGHT PLANE.

IF A DOME IS GOING TO ACT AS AN OIL TRAP THE OIL BEARING LAYERS CANNOT BE EXPOSED.

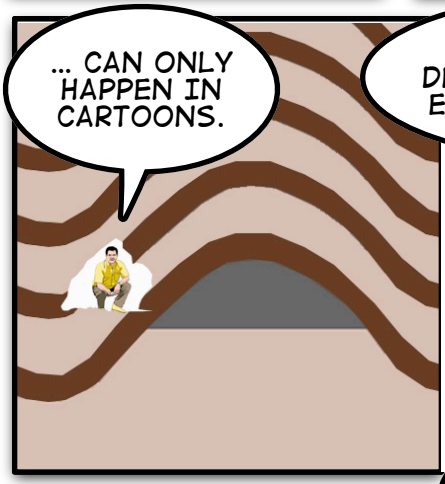


SO, USUALLY, OIL IS FOUND IN A DOME LOCATED BENEATH THE SURFACE.



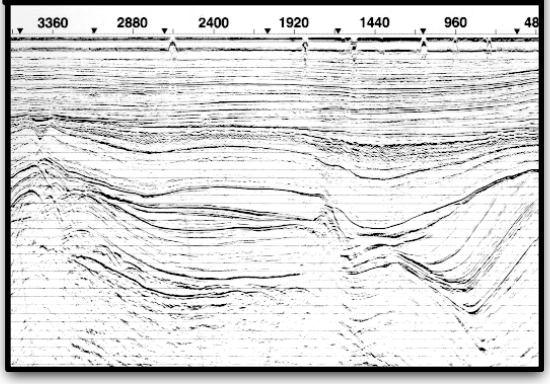
FINDING THESE DOMES CAN BE QUITE TRICKY, SINCE PHYSICALLY GOING SO FAR (KILOMETERS!)BENEATH THE SURFACE OURSELVES, JUST TO CHECK OUT THE ROCKS ...

... CAN ONLY HAPPEN IN CARTOONS.

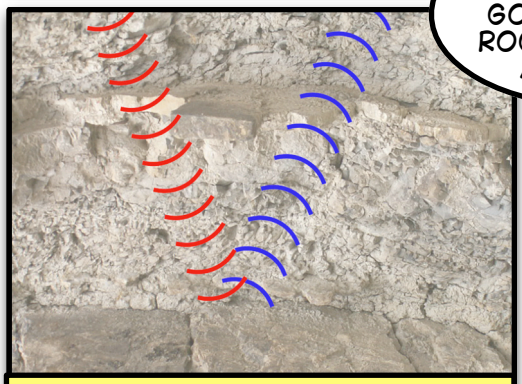


BUT WE CAN LEARN ABOUT THE DEEP STRUCTURE OF THE EARTH IN OTHER WAYS.

WE CAN USE A TECHNIQUE CALLED SEISMIC REFLECTION.

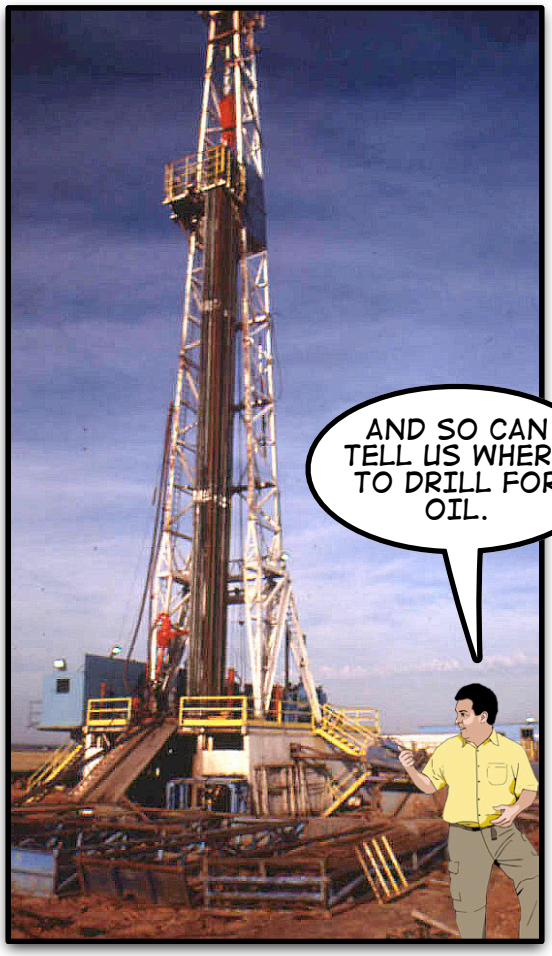


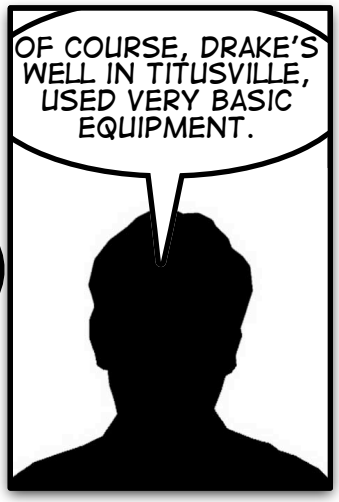
... WHICH ARE PRODUCED AS YOU GO FROM ONE ROCK LAYER TO ANOTHER.



WHICH DEPENDS ON SOUND BEING REFLECTED FROM HARDNESS CHANGES ...

THESE SEISMIC SECTIONS CAN SHOW US ANTICLINES DEEP IN THE EARTH, EVEN IF THEY ARE NOT OBVIOUS AT GROUND LEVEL





IN THOSE DAYS FINDING OIL WAS MOSTLY A MATTER OF LUCK. WE JUST WENT TO PLACES WHERE OIL SEEPS WERE KNOWN AND DRILLED A HOLE!