

## **HIGH-TECH REDNECK**

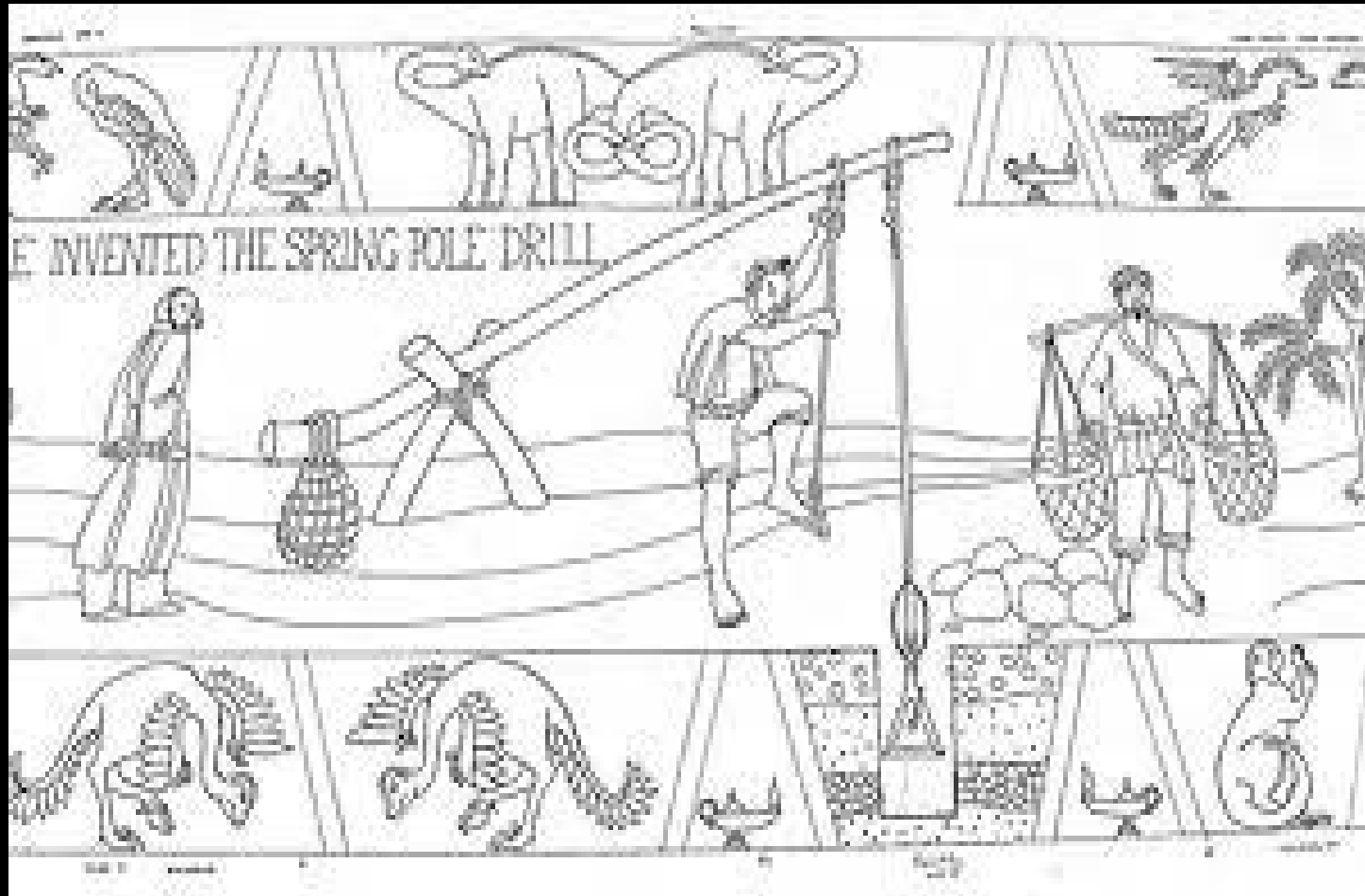
Past, Present, and Future Oil Field Technologies

By Allen Castleman

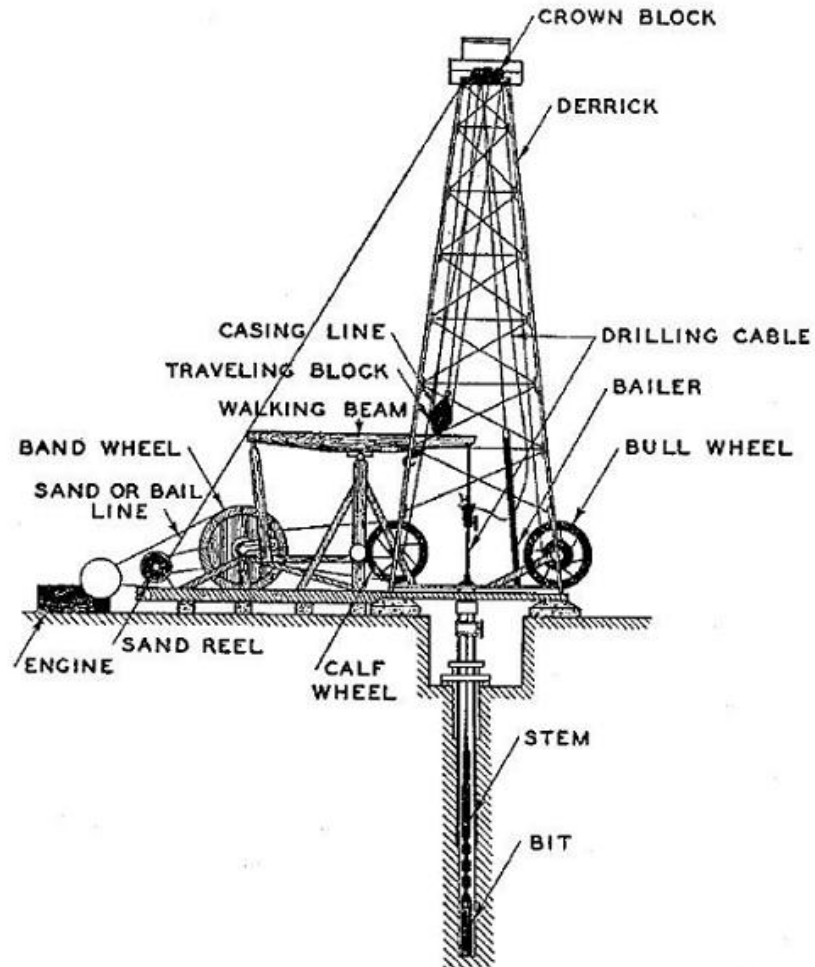
## CHINESE “DRILLING”

The Chinese have used oil and gas for many centuries. There is no record of when the Chinese began using natural gas, but the local people were drilling down hundreds of feet into the earth to get natural gas and brine before the start of the Han Dynasty, before 400 B.C. The Chinese used bamboo pipelines to carry natural gas and mix it with air to yield a usable source of fuel for fires.

## BAMBOO AND MANPOWER



## THEN CAME PULLEYS AND SIMPLE MACHINES



## FIRST MODERN DRILLING

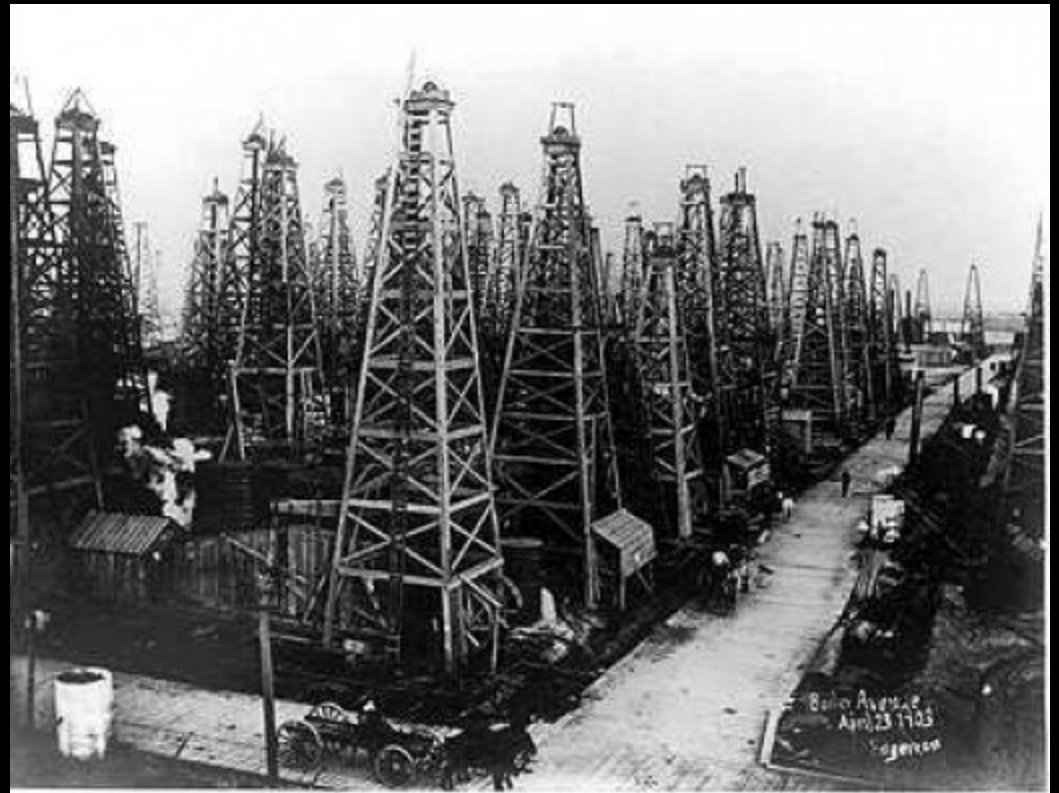
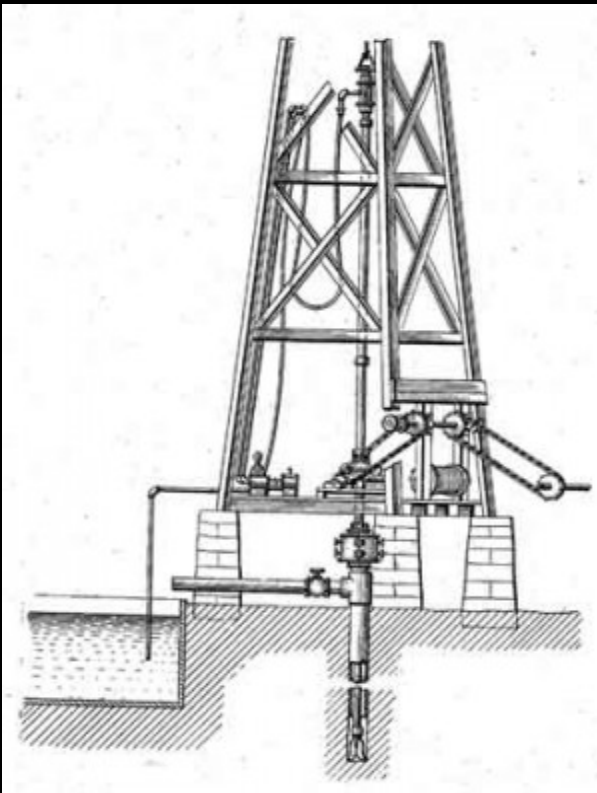
The first modern drilling began with former Army Colenol Edwin Drake. Drake struck oil at 69 feet below the surface using a cable tool rig in 1859. His new ideas and hard work set the foundation for oil booms similar to the California Gold Rush. He also used the first casing to prevent the hole from collapsing during drilling. Ironically he died in 1880 completely broke.

## ROTARY DRILLING

Rotary drilling is most often associated with the spectacular 1901 Spindletop Hill discovery near Beaumont, Texas.

Instead of the repetitive lift and drop of heavy cable-tool bits, rotary drilling introduced the hollow drill stem that enabled broken rock debris to be washed out of the borehole with re-circulated mud while the rotating drill bit cut deeper.

# DEEPER, FASTER, EFFICIENT DRILLING



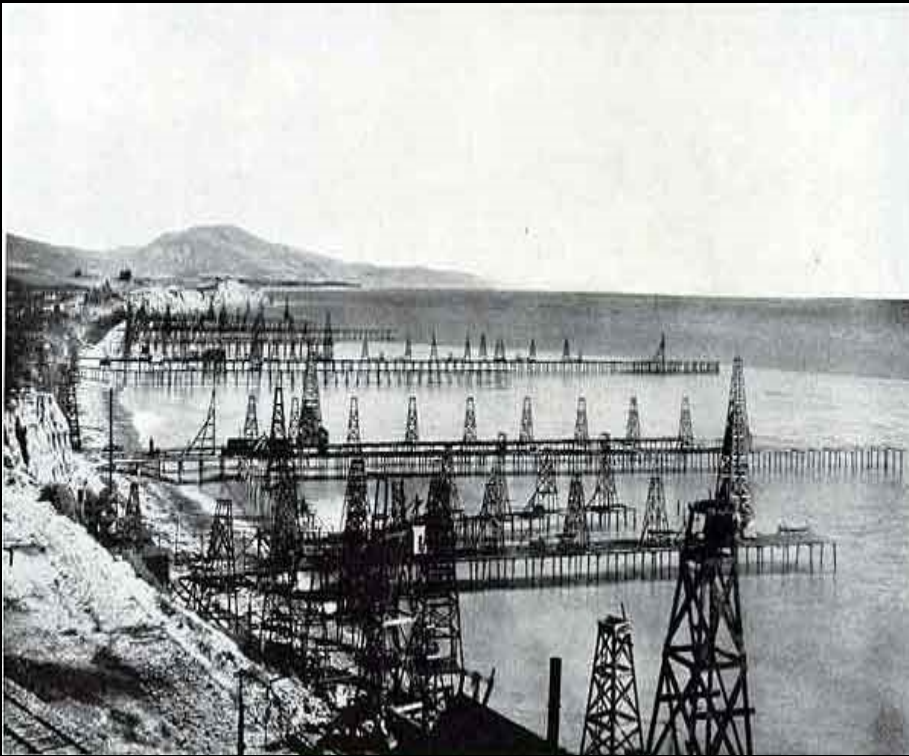
## OFFSHORE DRILLING BEGINS

In 1896 the lure of offshore production enticed Henry L. Williams and his associates to build a pier 300 feet out into the Pacific – and mount a standard cable-tool rig on it.

In 1911, Gulf Refining Co. abandoned the use of piers. It drilled Ferry Lake No. 1 on Caddo Lake, Louisiana, using a fleet of tugboats, barges, and floating pile drivers



**DRILLING AWAY FROM THE  
SECURITIES OF LAND**



## WORK HORSES

Before the use of modern vehicles, Horses would be the life line of the oilfield. Horses would bring the food and supplies to rigs as well as move them.

Horses would haul 40-50 loads with an average weight of 3,000 lbs. just to get a standard wooden rig ready. Then came up to 40 loads of casing and even more loads with several tons of coal all to drill one hole.

## HORSES CARRY THE LOAD



## THE 19<sup>TH</sup> CENTURY

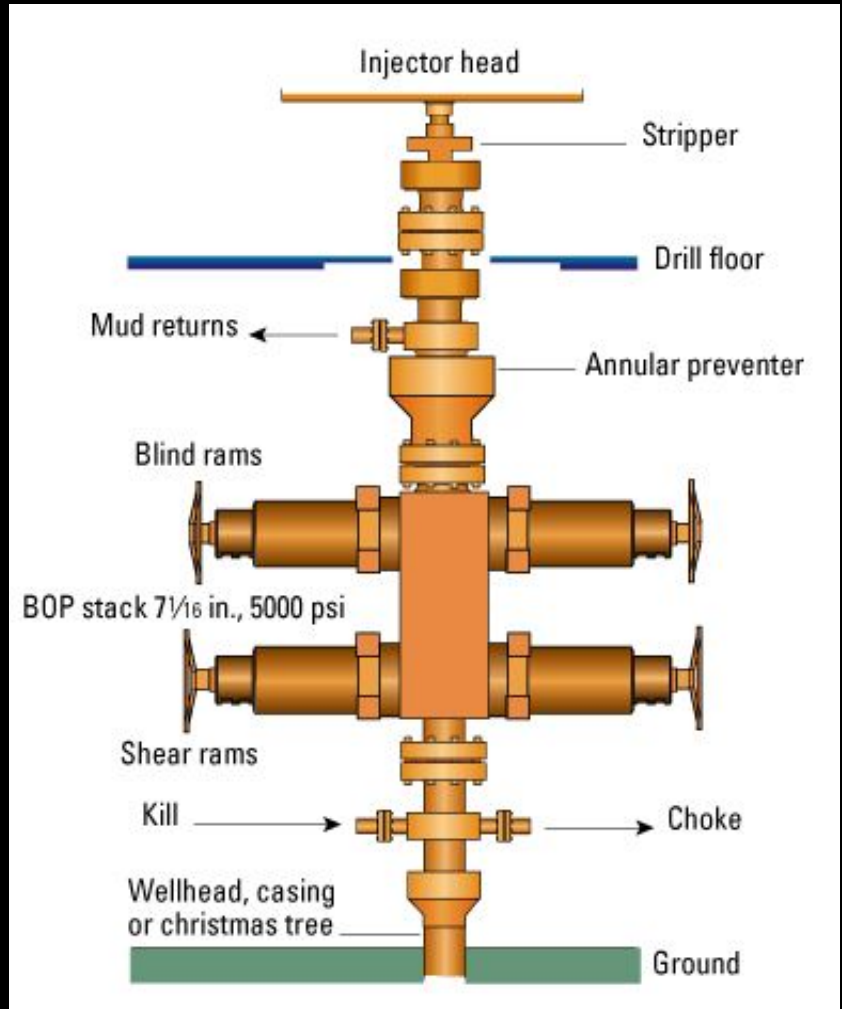
The 19<sup>th</sup> Century brings technology and safety together. As engines, automobiles, electricity, plastics, and eventually computers are invented and developed the oil field helps establish a growing science of engineering safety. Products at home, across the world, and in space become better and stronger with help from the oil field.

## THE B.O.P.

James Abercrombie came up with the idea for a “ram-type” blowout preventer. He sketched his idea on the sawdust floor of the Cameron Iron Works machine shop in Humble, Texas.

The blowout preventer saved lives and quickly became an industry standard.

# AN END TO THE "GUSHER"



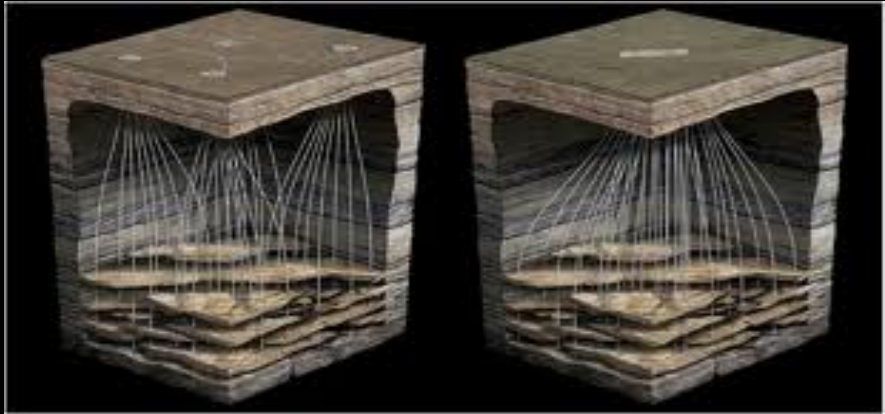
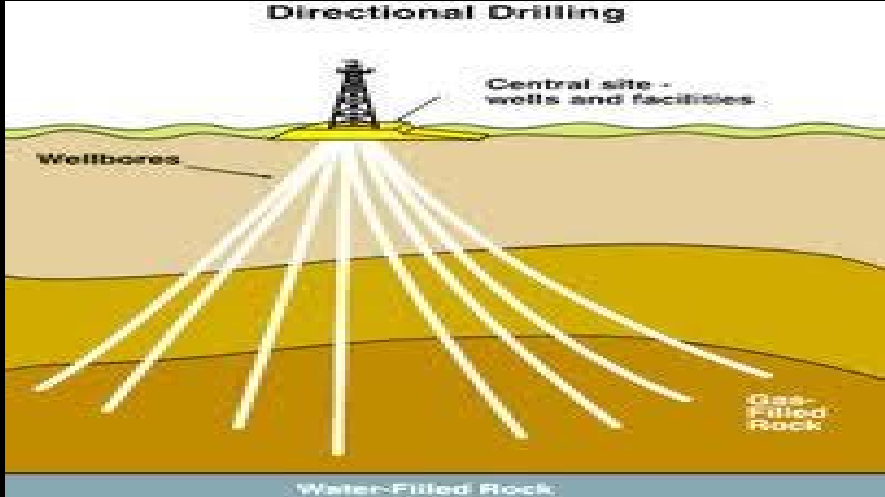
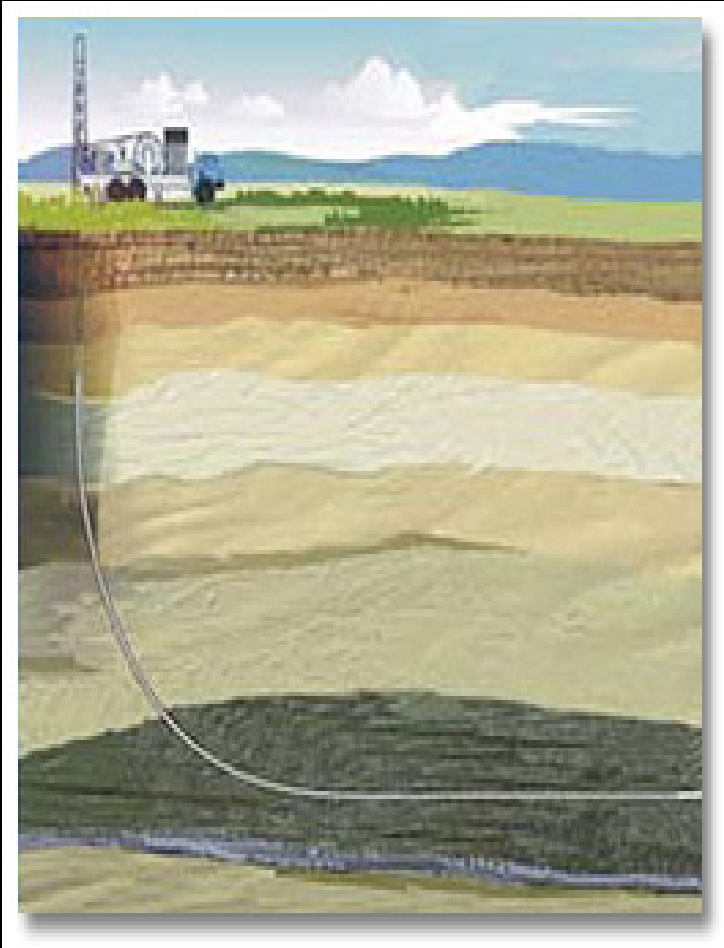
## MEASUREMENT WHILE DRILLING

MWD is a system developed to perform drilling related measurements down hole that are transmitted to the surface while drilling a well.

MWD systems can take several measurements such as Gamma Ray, compass direction (shown as azimuth), tool face (the direction that your bit is pointing), borehole pressure, temperature, vibration, shock, torque, etc.

MWD allows a driller to control how and where his “hole” goes. This has increased efficiency of drilling by allowing drillers to plan the best place to enter the rock and oil layers.

# EFFICIENCY THROUGH TECHNOLOGY





## TRUCKING IMPROVES

Replacing horses with vehicles not a popular idea at its time. People believed that trucks would not be able to transport goods beyond the cities and town of America. However with the invention of the Model T, vehicles became affordable for the first time and began to spread across America and road systems soon followed. This set the path for many trucking companies to begin coast to coast hauling and made trucks even bigger and stronger.

Engineering and computers allow the use of more powerful engines and planetary gears.

Cable pulleys and A-frame cable lifts are replaced by winches on cranes and pole trucks.

Wire rope manufactures produce stronger longer lasting rope to replace weaker fiber ropes.

# TRUCKING GROWS



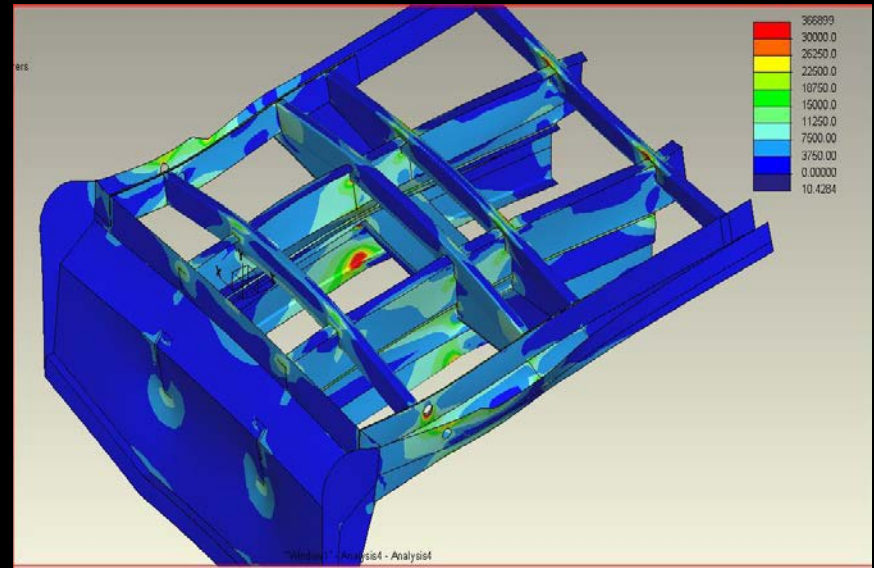
## THE FUTURE OF TRUCKING

The use of 3-D computer technology has allowed for trucks to begin a new transformation.

Trucks can be engineered to reach maximum lifting capabilities while maintaining weight requirements and safety ratings.

Modern steel testing tools can ensure the right materials are used for the right job. Sometimes steel can be changed to a lighter steel to reduce weight and maintain requirements and sometimes steel needs to be stronger.

**TRUCKING COMPANIES CAN HAVE LOAD CHARTS AND EVEN WIRELESS TECHNOLOGIES THAT ALLOW SAFE LIFTING AND DRIVER KNOWLEDGE OF EXACT WEIGHTS BEING LIFTED THROUGH LOAD CELLS AND POLE ANGLE INDICATORS.**



## PROTECTING OUR FUTURE

Although the Oil Field is commonly referenced as harmful to and/or destroying the environment, Oil companies around the world are the largest contributors to saving our planet.

From general clean up operations and volunteer work, to the building of new artificial reefs which have contributed to the survival of over-fished and endangered species, many companies have not only made a difference to better our earth but actually saved some of its inhabitants from extinction.

## SAVING THE OCEAN



## THE OIL FIELD PUSHES TO SPACE

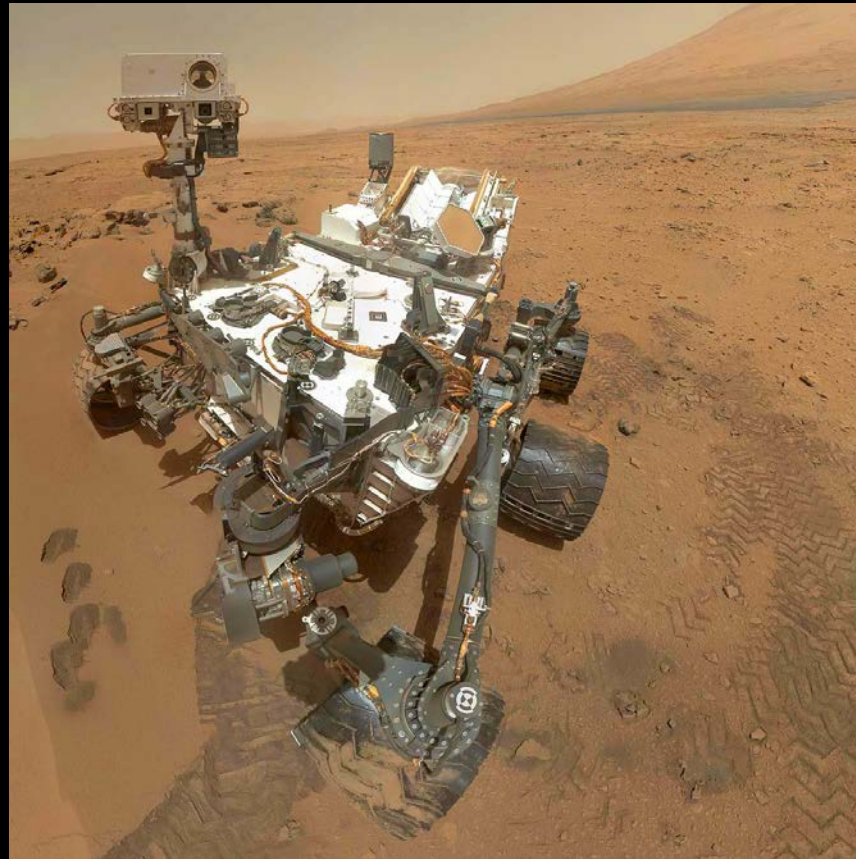
On September 20<sup>th</sup> 1970, at 06:03 UT, a robotic landing craft used an automatic drill to penetrate the surface of the moon and collect a soil sample. After drilling for 7 minutes, the drill reached a stop at 35 centimeters depth and then withdrew its sample.

This was the first time man had drilled into rock not on the earths surface.

In 2013 NASA drilled into the first rock on the planet Mars. Using this drilling technology Nasa was able to begin testing samples below the surface of the planet.



## DRILLING ON MARS



## NASA RECRUITS THE OIL FIELD

Deep Sea drilling began an Oceanering industry that created tools now being used on the International Space Station, like a pistol-grip space screwdriver. It also built the Robonaut, an experimental robot with a human shape. It's now being tested on board the space station. NASA has also used oil field companies to help develop its space suits. Deep sea diving research done by oil companies has produced suits and robotics used by our astronauts in space.

## DEEP SEA LEAVES EARTH

