

Fundamentals of Onshore Drilling



Fundamentals of Drilling

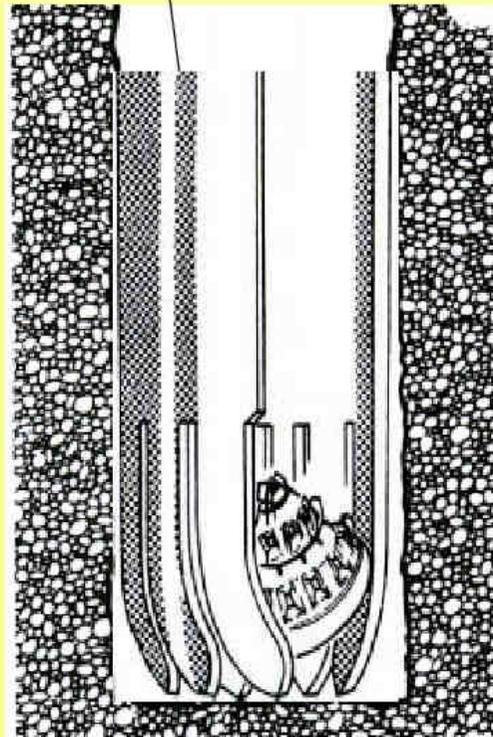
Fishing – Stuck Pipe Problems

presentation No. 4

references:

- Bernt S. Aadnoy, Iain Cooper, Stefan Z. Miska, Robert F. Mitchell, Michael L. Payne: *Advanced Drilling and Well Technology*. SPE 2009, ISBN: 978-1-55563-145-1.
- Robello G. Samuel, Xiushan Liu: *Advanced Drilling Engineering – Principles and Design*. Gulf Publishing Company, Houston Texas, 2009, ISBN: 978-1-933762-34-0.
- Joe DeGeare, David Haughton, Mark McGurk: *The Guide to Oilwell Fishing Operations (Tools, Techniques and Rules of Thumb)*. Gulf Drilling Guides, Houston, Texas, 2009, ISBN: 978-0-7506-7702-2.
- *A Primer of Oilwell Drilling*. Petroleum Extension Service, Houston, Texas 2001, ISBN: 0-88698-194-8.
- Robello, R. G.: *Downhole Drilling Tools*. Gulf Publishing Company, Houston, Texas 2007, ISBN: 978-1933762135.

Causes for Fishing Operations



Fishing is any operation or procedure to release, remove or recover tubulars or other material in the hole that adversely affects drilling casing or completing operations

Categories requiring a **Fishing Job**

- **Drillstring stuck**
 - Formation related
 - Drilling Operation related
- **Failures of Equipment**
 - Roller Cones
 - Drillpipe rupture
 - Packers
- **Objects lost**
 - Logging Sondes
 - Packer Elements
 - Tools fallen into hole

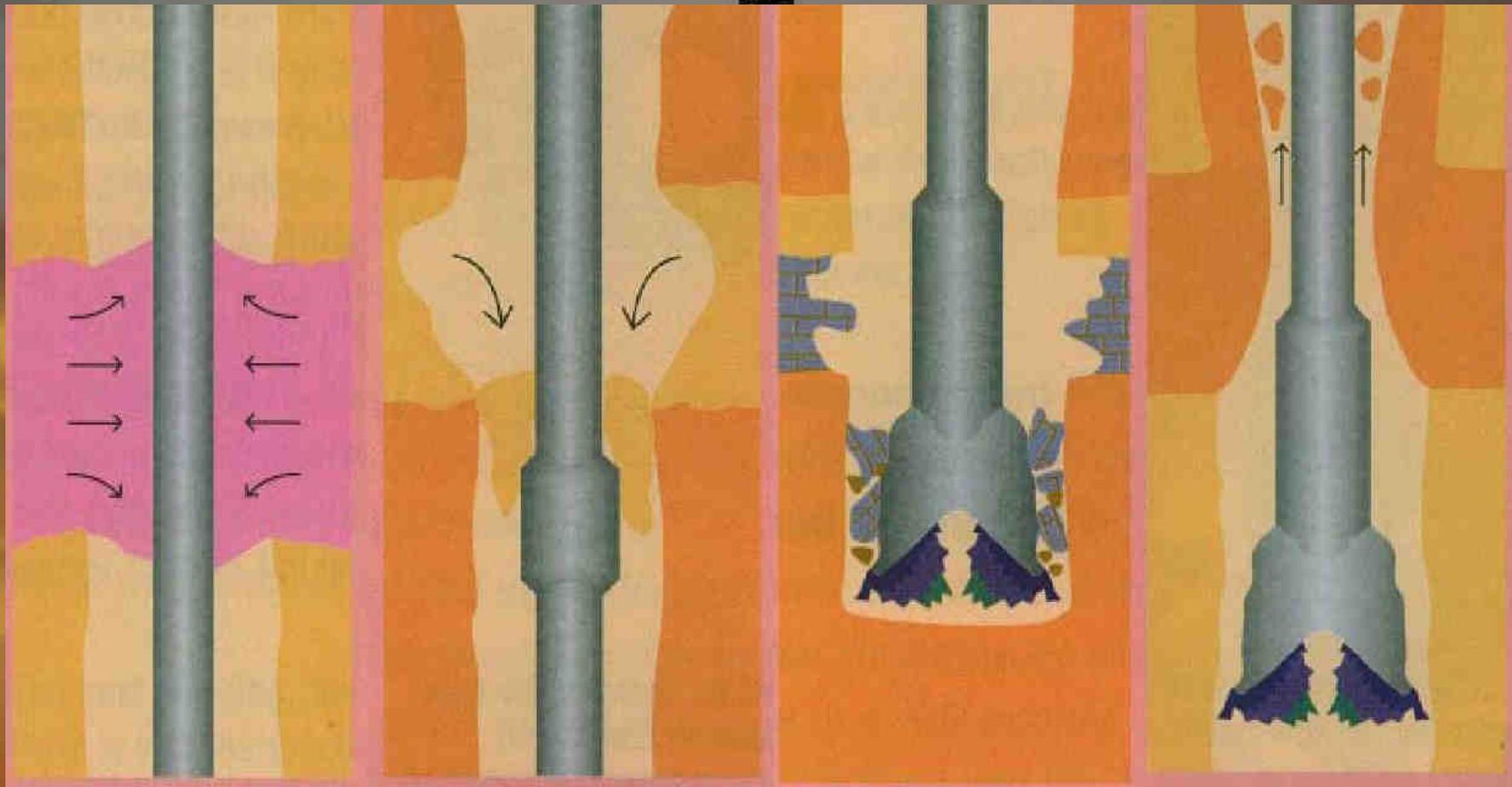
Causes of Stuck Drill String

It is estimated that drilling industry spends **\$200 to \$500 millions annually** due to **stuck drill string** related hole problems

(1) Formation related Causes

(2) Drilling Operation related Causes

1. Formation Related Causes of Stuck Drill String



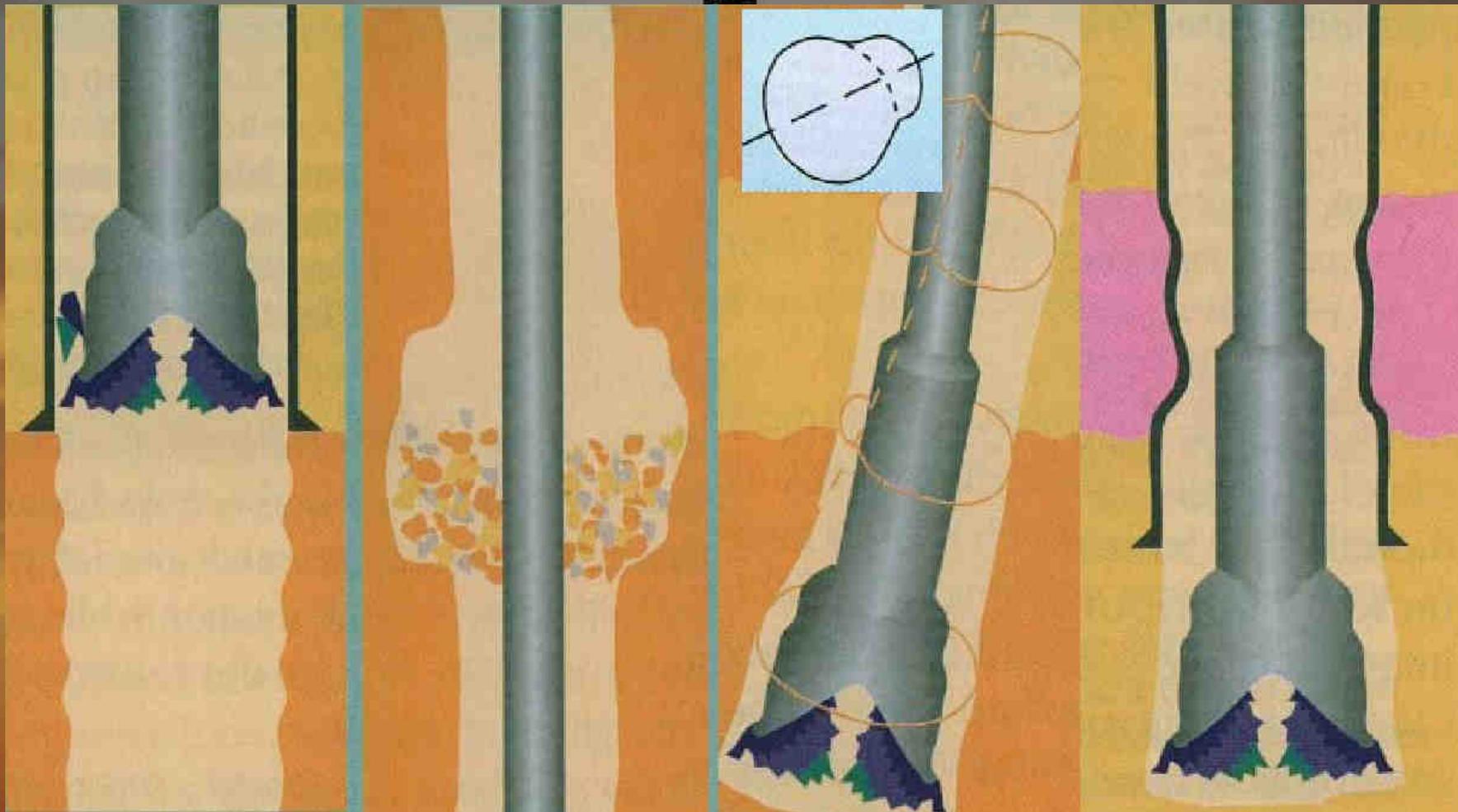
**Mobile Formations
(salt, plastic shale)**

**Unconsolidated
Formations
(sands, gravels)**

**Fractured / Faulted
Formations
(fault/rubble zones)**

**Reactive Formations
(swelling clays)**

2. Drilling Operation Related Causes of Stuck Drill String



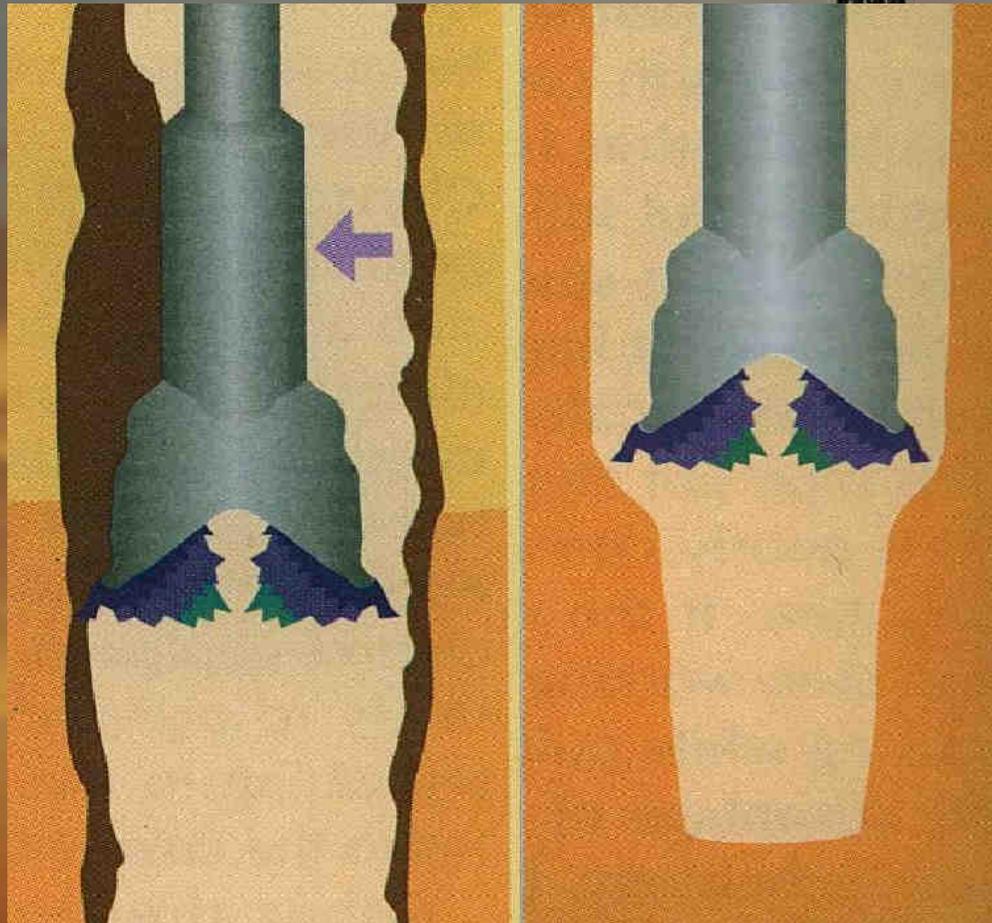
**Junk in Hole
(lost roller cone)**

**Poor Hole
Cleaning**

**Keyseat in
Doglegs**

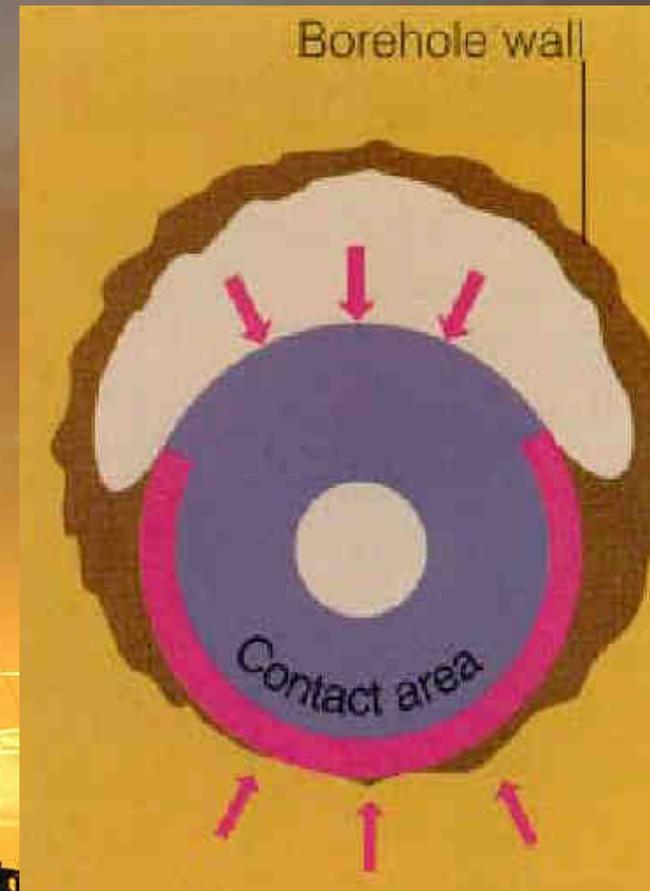
Collapsed Casing

2. Drilling Operation Related Causes of Stuck Drill String



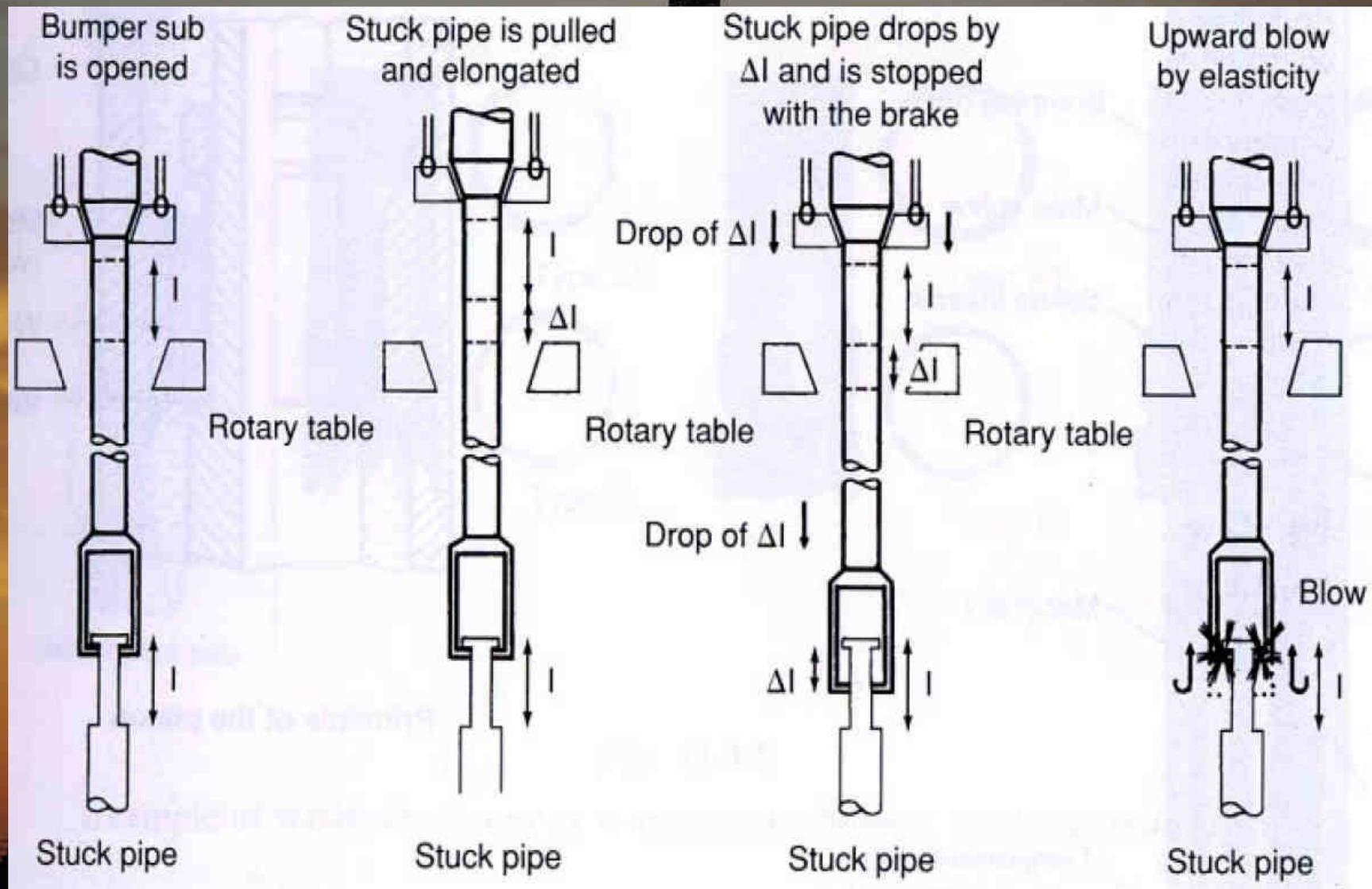
Differential Sticking
Mud Cake
Too Thick

Undergauge Hole
Worn Bit Gauge

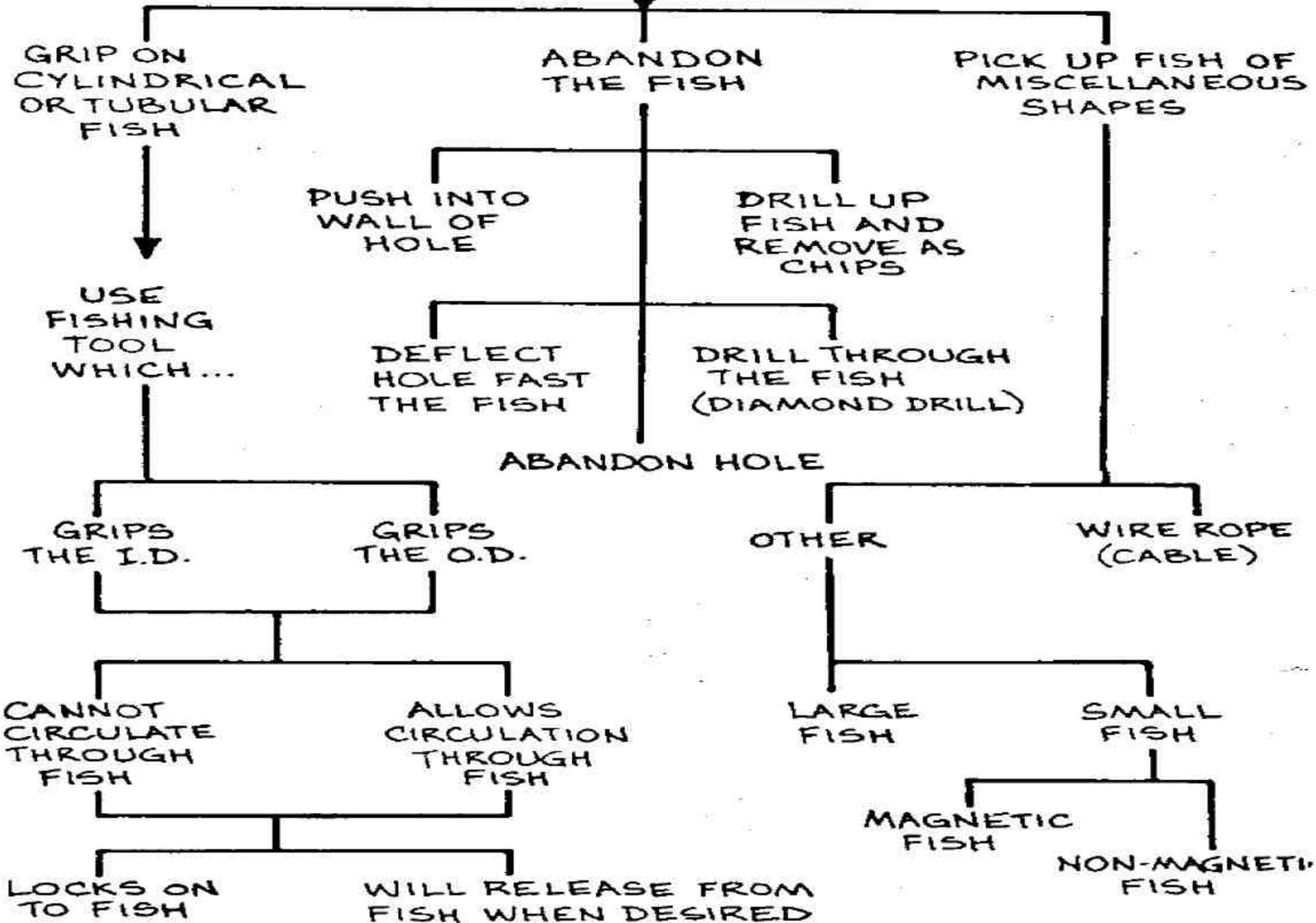


Cement Related
Flash Setting
of Cement

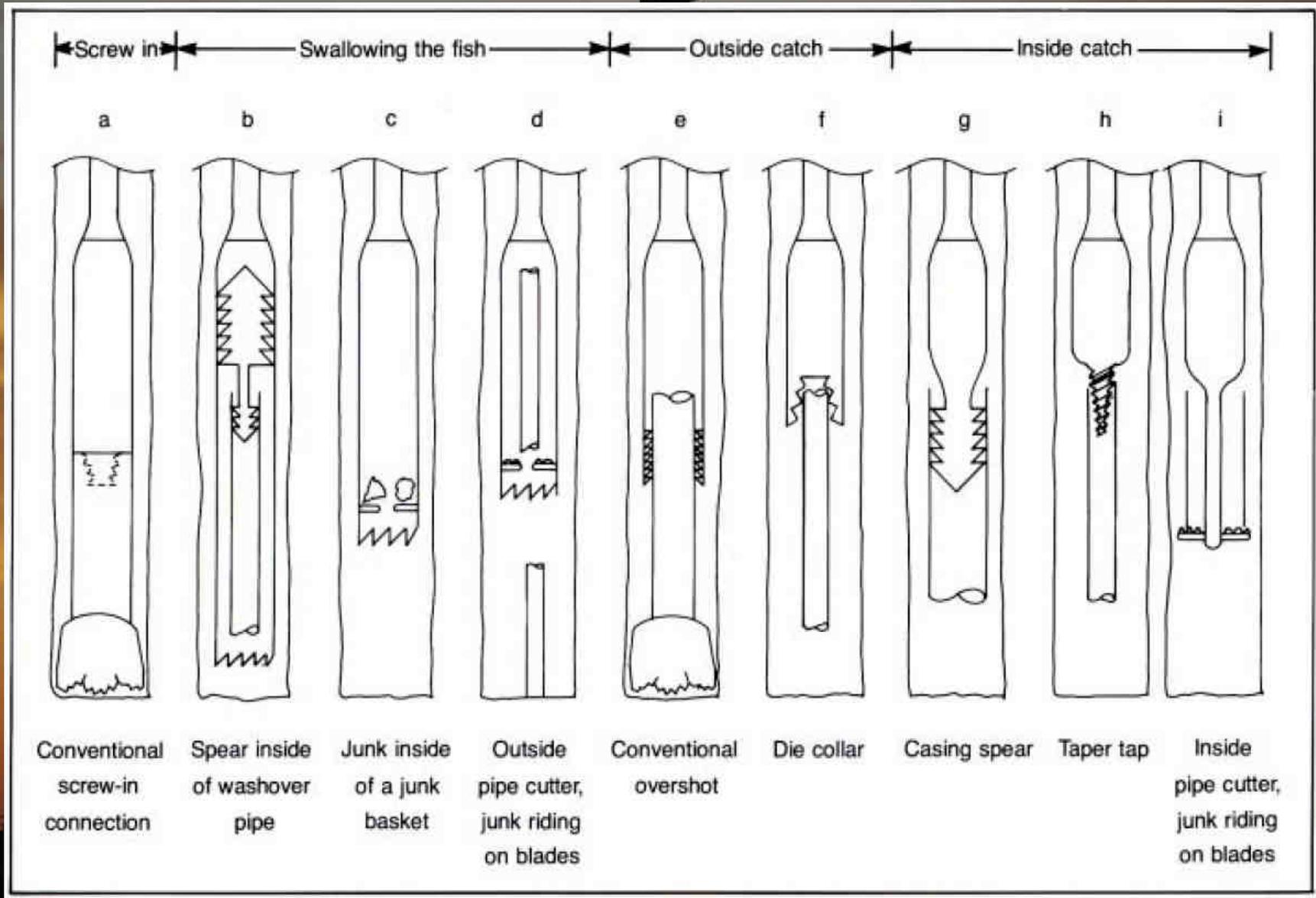
Principle of Jarring Operation



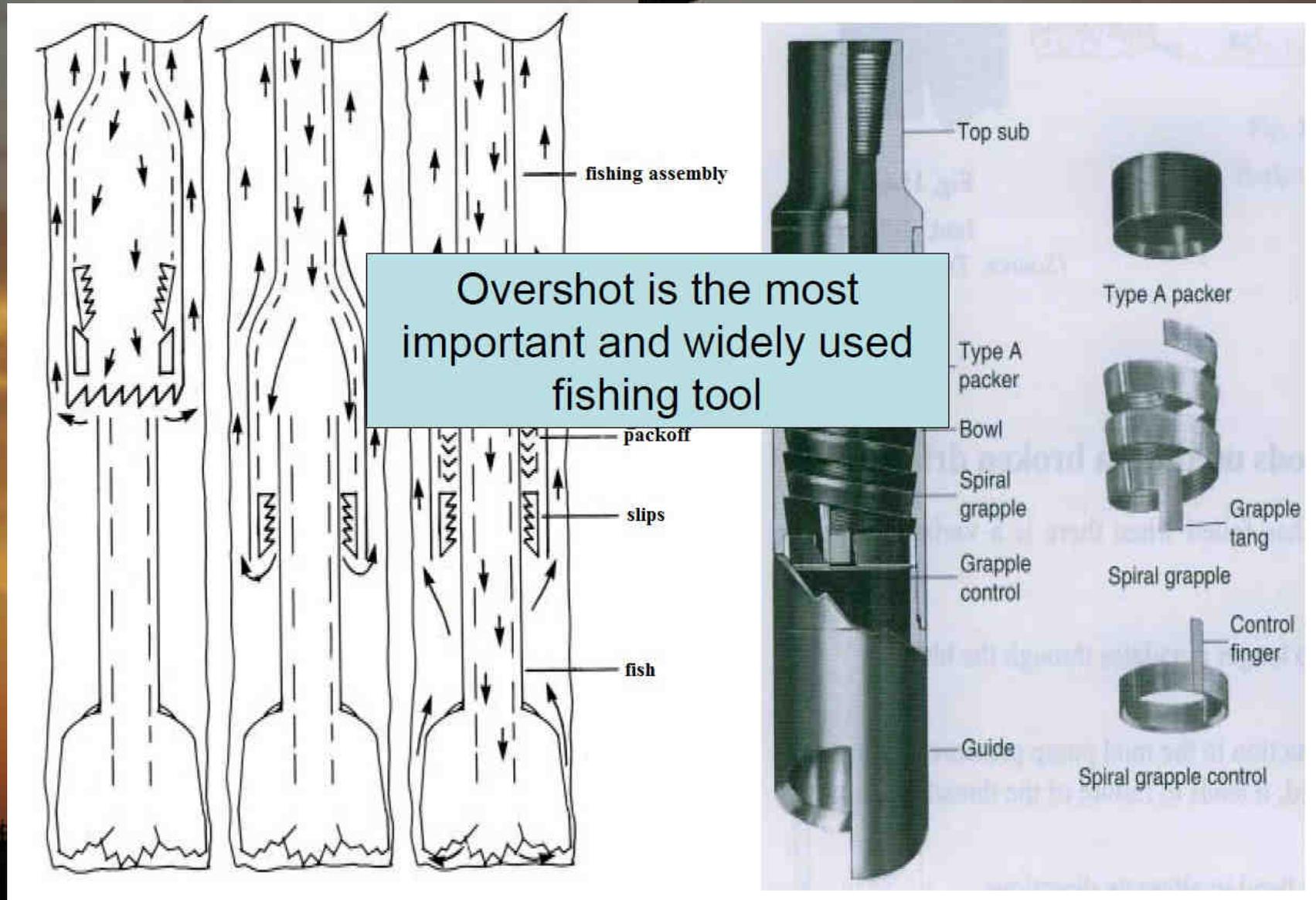
OPTIONS FOR HANDLING A FISH



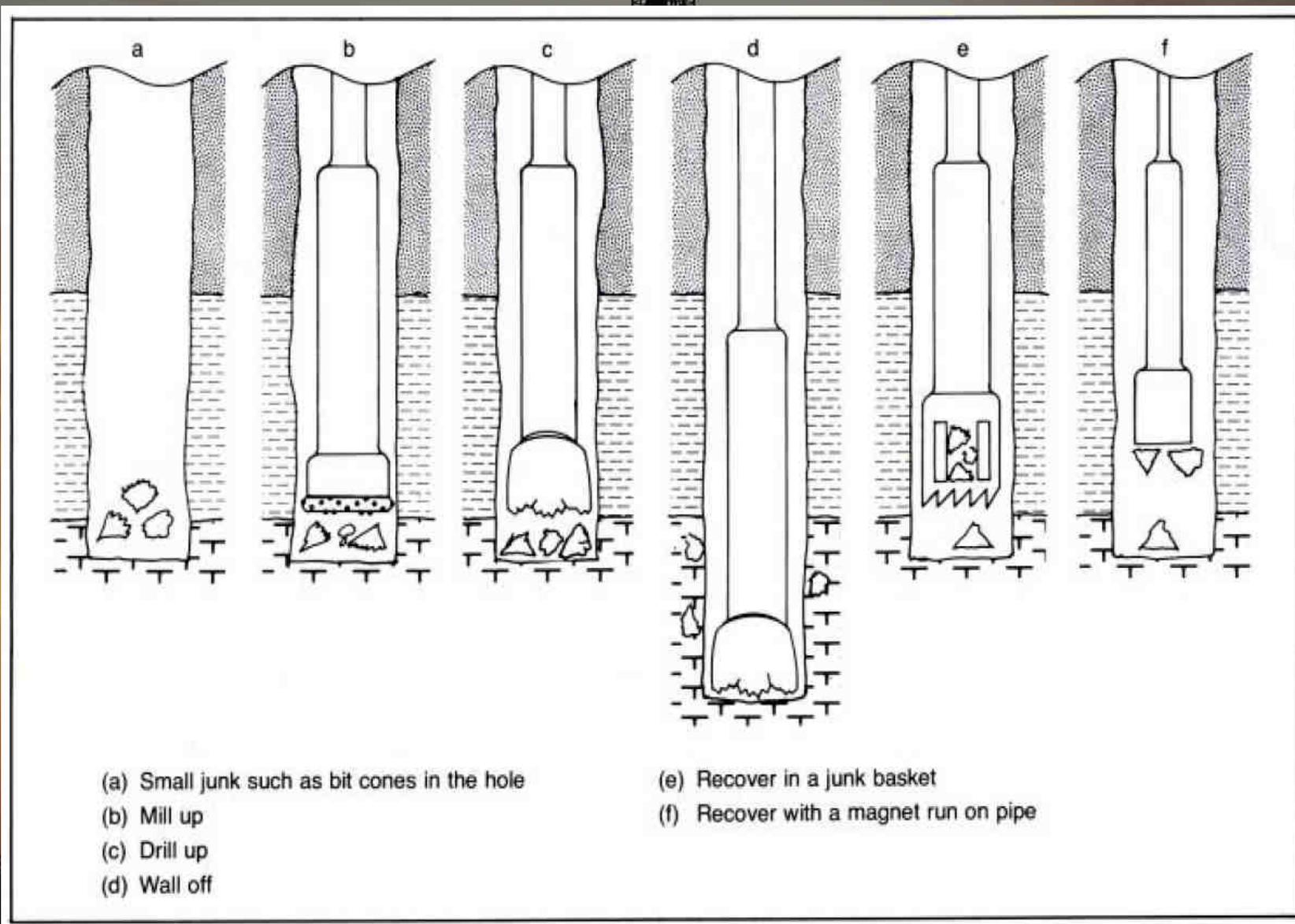
Techniques for Catching the Fish



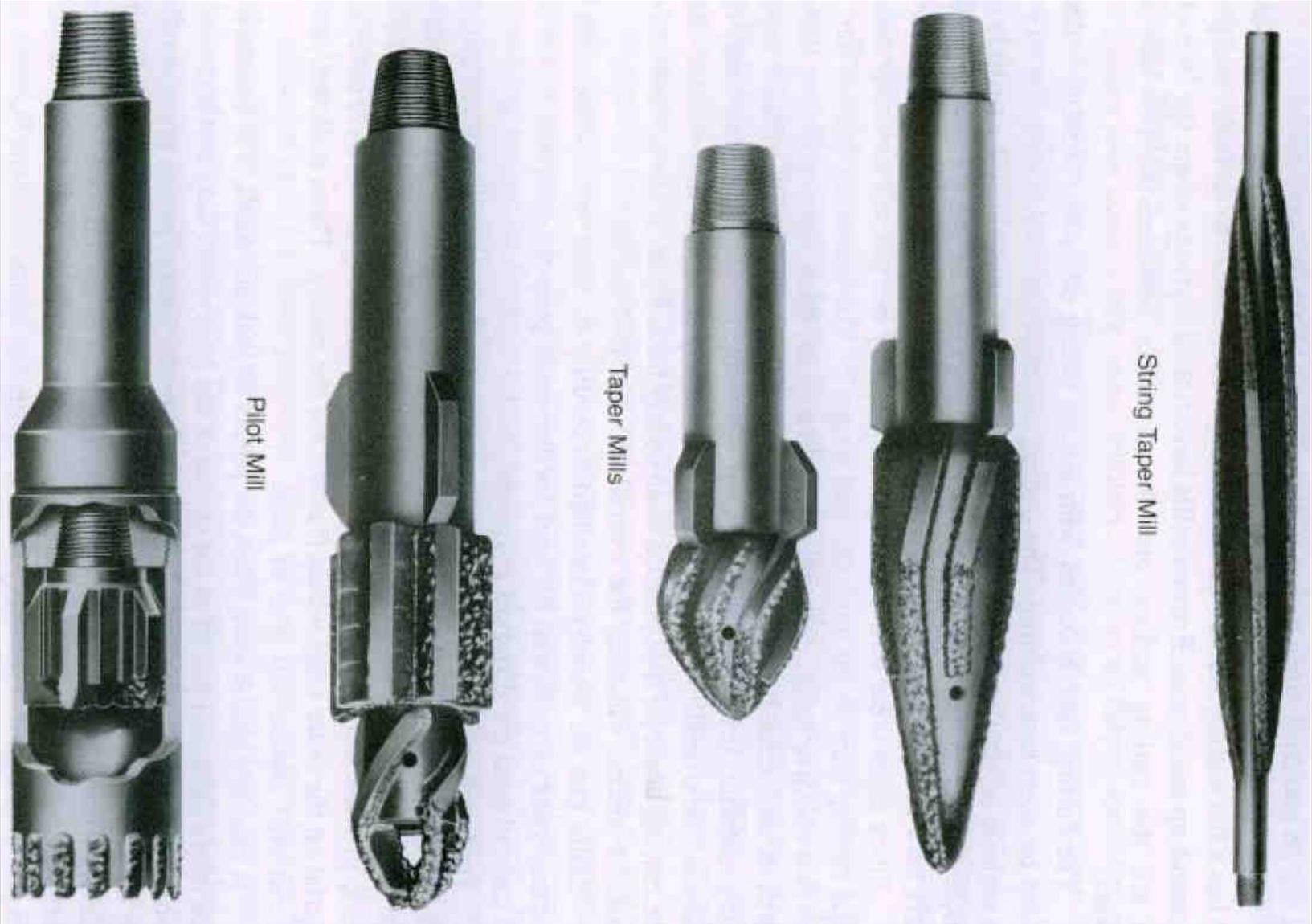
Principle of Overshot Operation



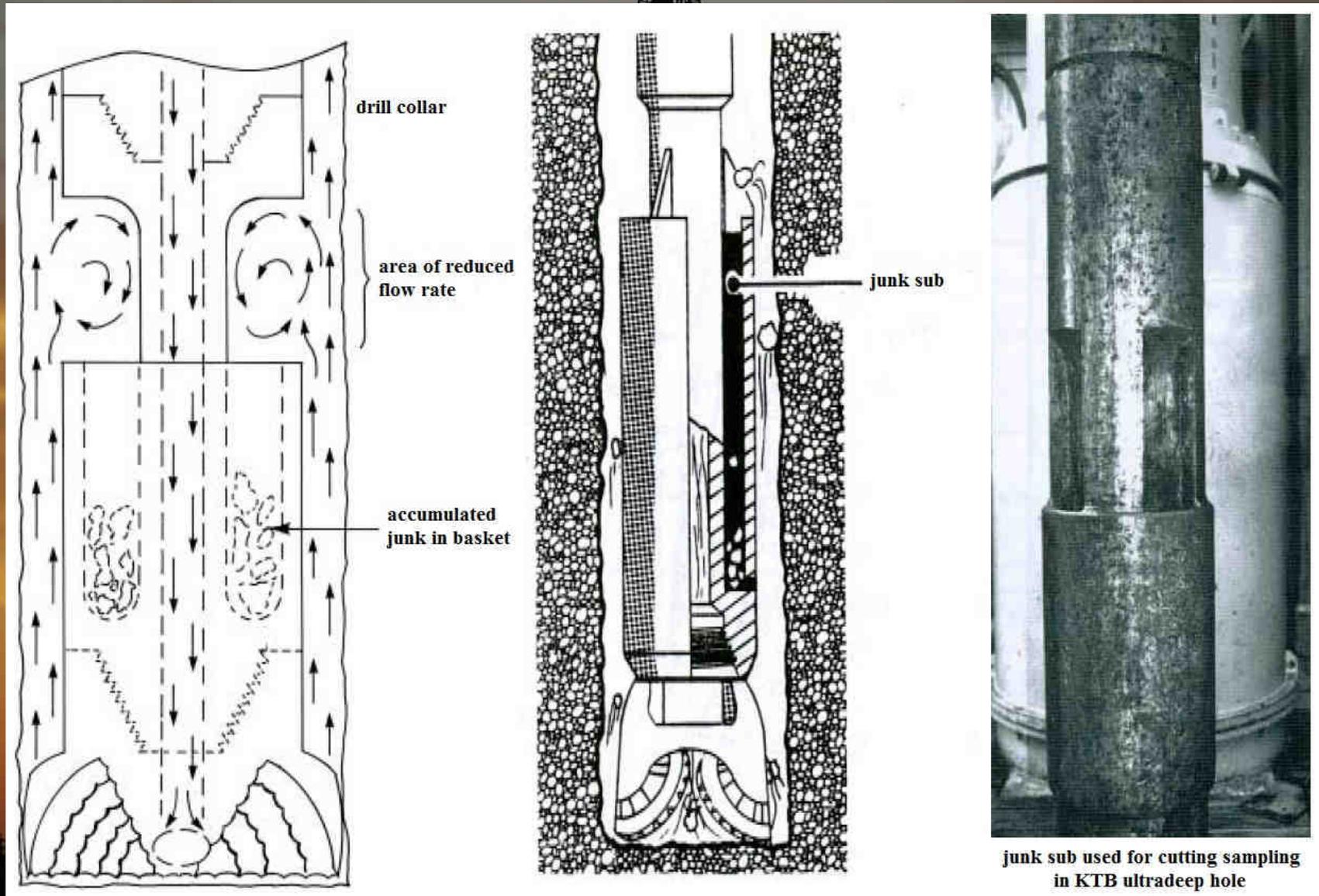
Recovering or Removing Small Junk



Various Types of Milling Tools

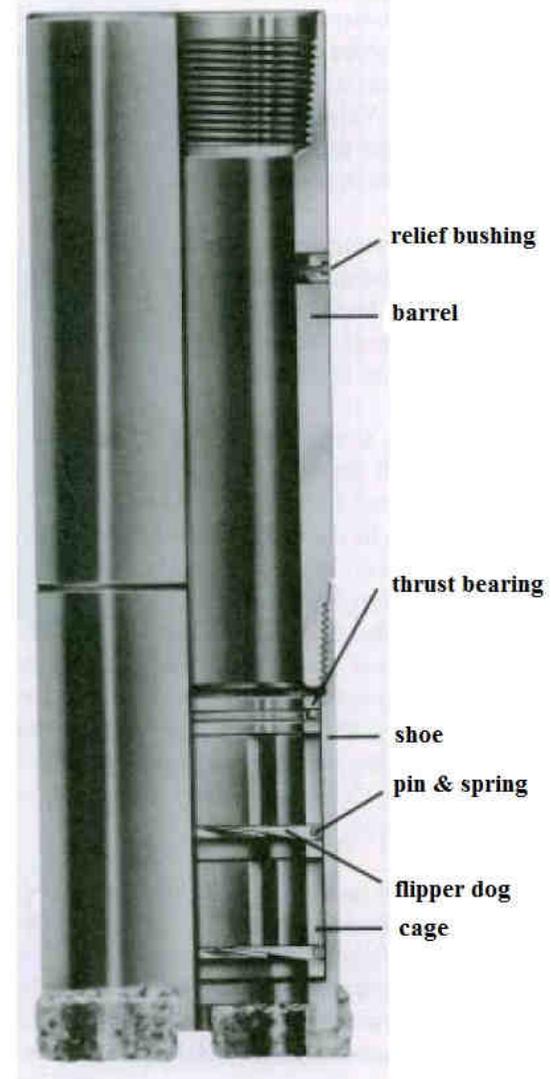
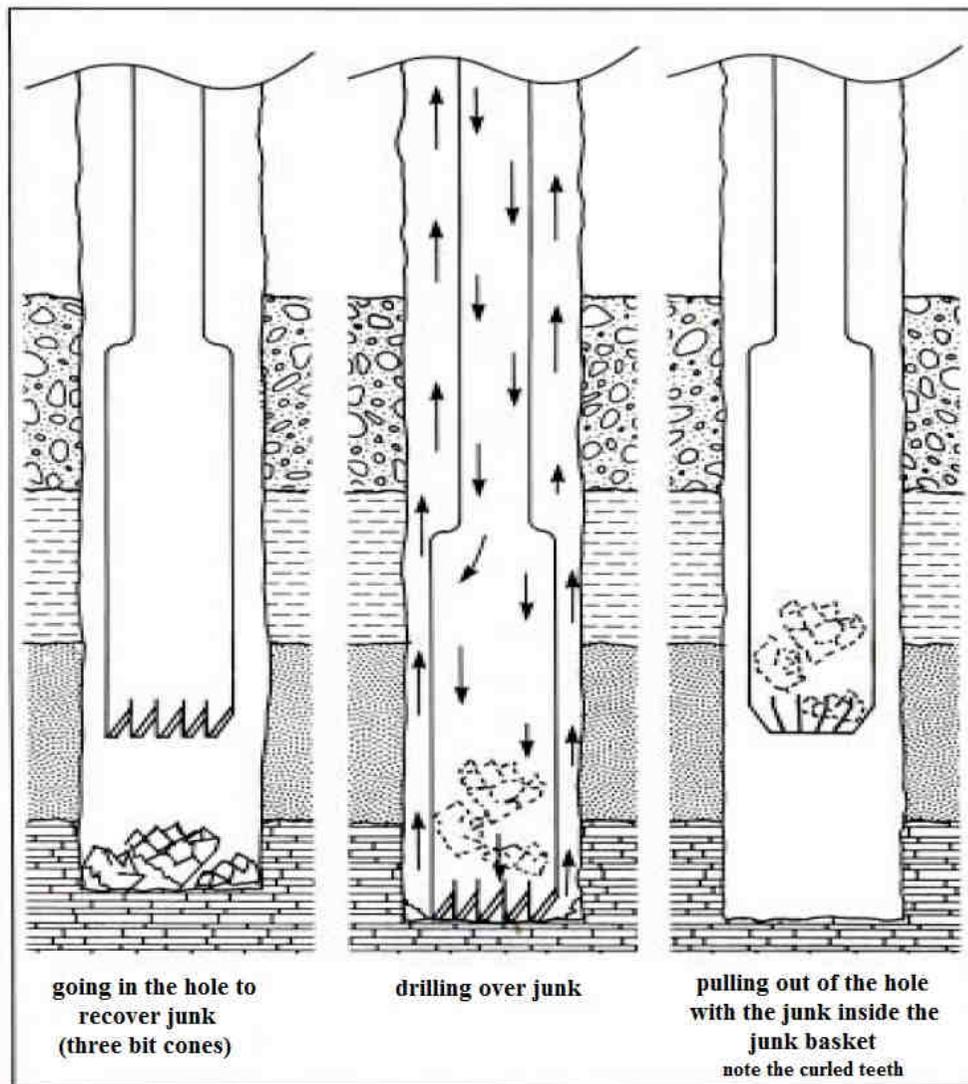


Working Principle of a Junk Sub

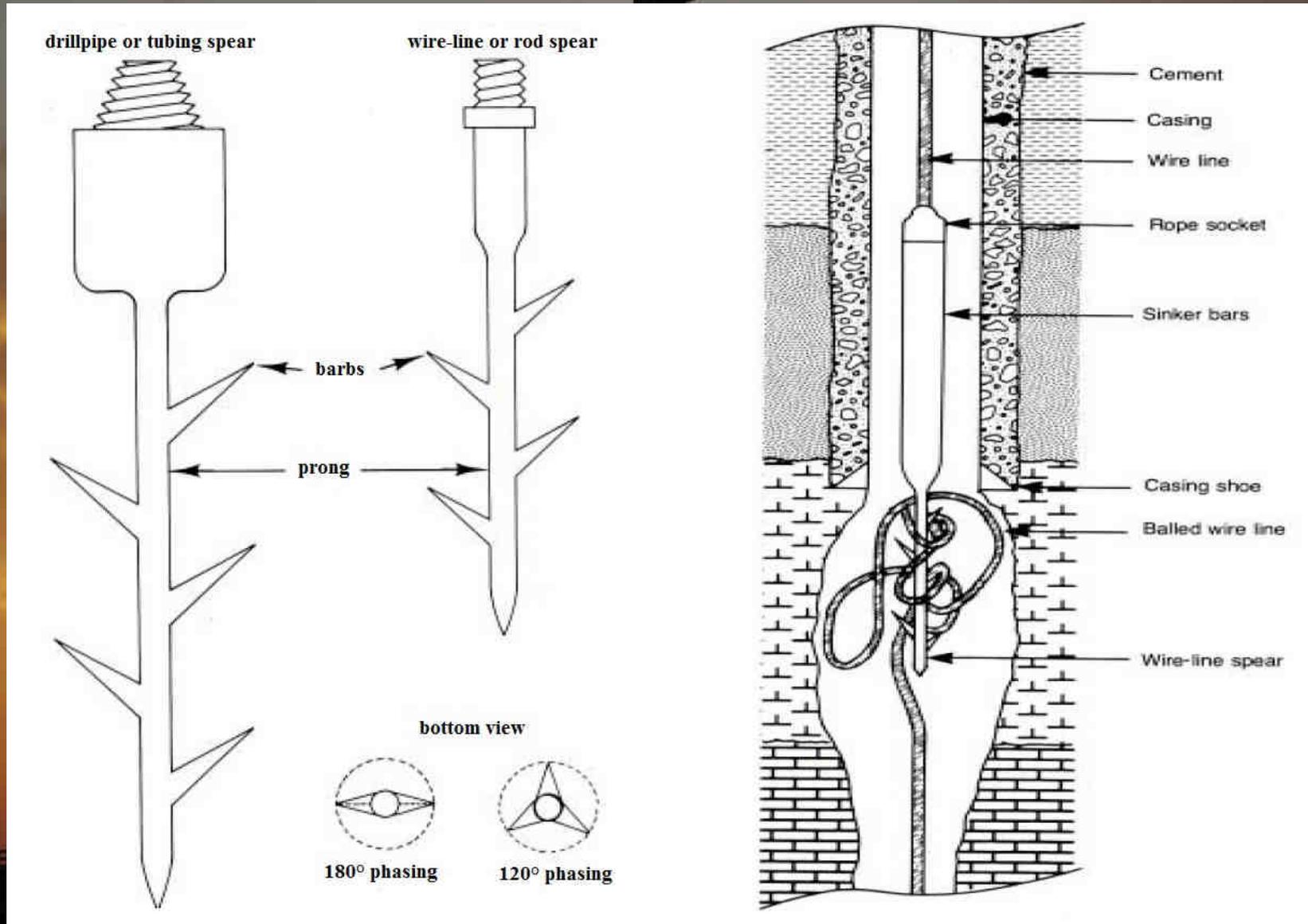


junk sub used for cutting sampling in KTB ultradeep hole

Catching Roller Cones with Junk Basket



Catching Logging Cable with a Wire-Line Spear



Fishing Tools



Fishing Tools



Fishing Tools



THE END!!!

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