

Geol 415 Petroleum Geology

Spring, 2004

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**COURSE OUTLINE
&
REFERENCES**

Tentative List of the Topics to be Covered

- ❖ **General Introduction**
- ❖ **Sources of Information**
- ❖ **Terminology**
- ❖ **A Brief History of the Science of Petroleum Geology**
- ❖ **Facts and Figures**
- ❖ **Physical Properties**
- ❖ **Chemistry of Hydrocarbons**
- ❖ **Origin of Petroleum**
- ❖ **Migration of Hydrocarbons**
- ❖ **Reservoirs and Accumulation of Hydrocarbons**
- ❖ **Basins**
- ❖ **Wire-line Logs**
- ❖ **Subsurface Mapping**
- ❖ **Case Histories (including examples from Saudi Arabia)**

Methods of Instruction

The course consists of two sessions of 75 minutes lectures per week. When deemed necessary, some lectures will be substituted with appropriate instruction videos. Most of the lecture materials will be posted in the university WebCT ®.

Class Attendance Policy

Attendance in the class is expected and required. If you are going to miss a class for a valid reason, you must inform your instructor at least a week ahead of the lecture to arrange alternatives to cover the missed lecture (s).

Grading & Examination

Major Examination 1	20%
Midterm	20%
Final	25%
Assignments (3)	15%
Quizes (3)	15%
Attitude and Class Attendance	05%

Example of an Examination

Section A

Answer any thirty

30 × 3 = 90

1. The most commonly used parameters for determining the origin (organic vs. inorganic) of natural gas:

- a. Isoprenoid
- b. Carbon isotope
- c. Polyaromatic hydrocarbons
- d. n-alkane

2. Oils having API gravities about ----- are usually biodegraded, high in sulfur content, or both.

- a. 40°
- b. 50°
- c. 10°

3. Dry gases are usually formed during: formed either by or by.

- a. Early cracking of oil
- b. Catagenesis of kerogen
- c. iagenesis of freshly-deposited organic matter in the sediment.

Example of an Examination (Contd.)

Section B

Answer any one of the following:

10 × 1 = 10

1. What is Oil shale? Are they really shale? Prepare a table to show the difference between oil shales and oil-source sediments (source rocks for hydrocarbons).

OR

2. List the common solid and plastic hydrocarbons. What is tar sand? Discuss the origin of Athabasca Tar Sand in Alberta, Canada.

Textbook

Tissot, B.P., and Welte, D.H., 1978, Petroleum Formation and Occurrence – A New Approach to Oil and Gas Exploration: Springer-Verlag, Berlin. (Not available at the KFUPM bookstore this semester.)

Other Suggested References

Waples, D.W., 1985, Geochemistry in Petroleum Exploration: International Human Resources Development Corporation, Boston, USA.

Levorsen, A.I., 1967, Geology of Petroleum: W.H. Freeman and Company.

Link, P.K., 1987, Basic Petroleum Geology: Oil & Gas Consultants International, Inc., Oklahoma, USA.

North, F.K., 1986, Petroleum Geology: Allen & UnWin, 607p.

✓ **Selley, R.C., 1998, Elements of Petroleum Geology: W.H. Freeman and Company, New York.**

Dickey, P.A., 1981, Petroleum Development Geology: PenWell Books, Tulsa, Oklahoma.

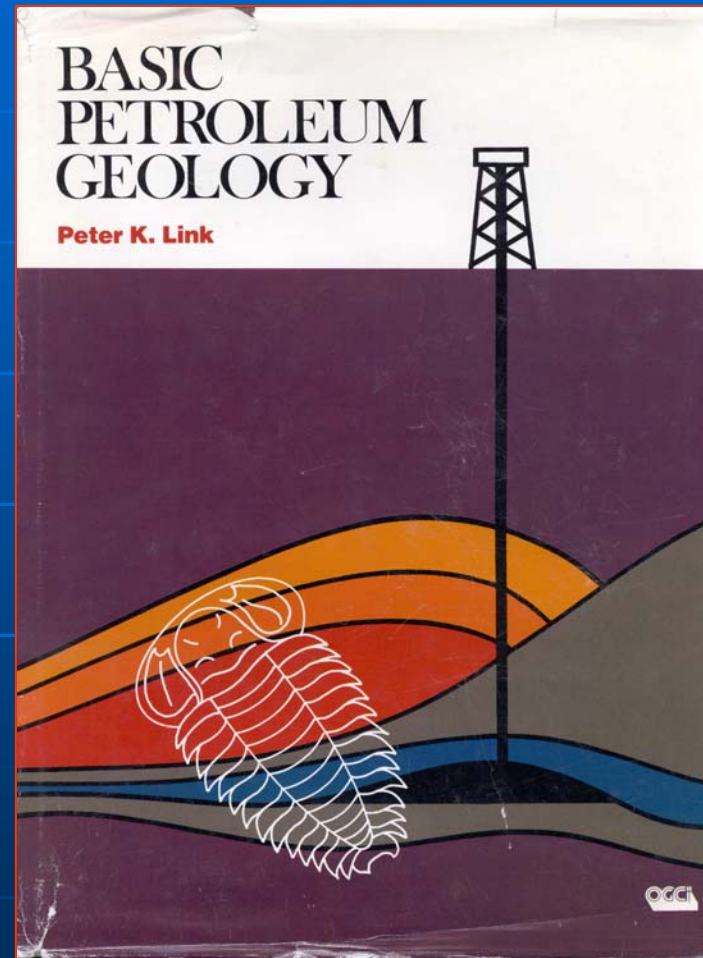
Development Geology Reference Manual: AAPG Methods in Exploration Series, No. 10.

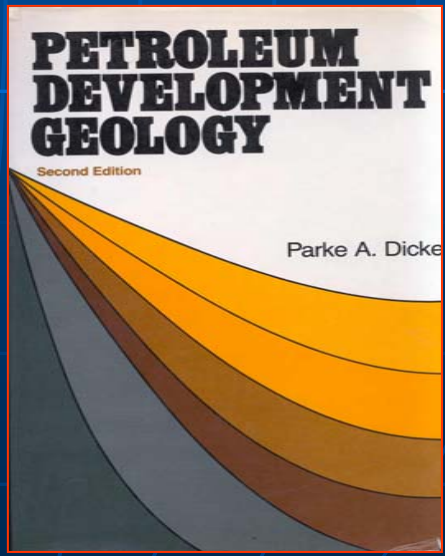
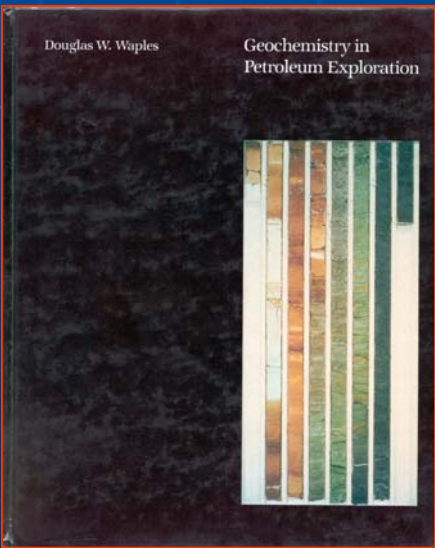
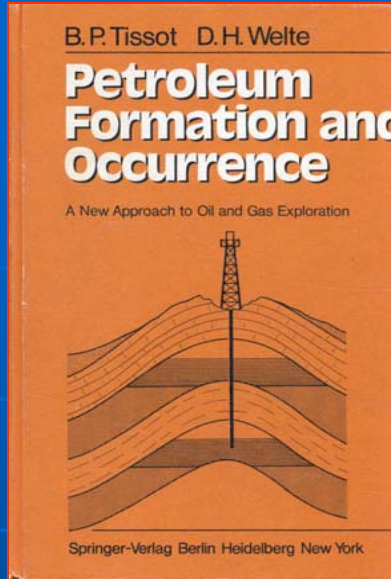
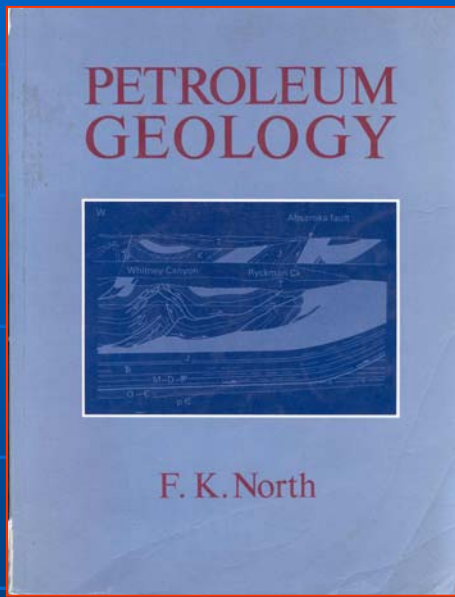
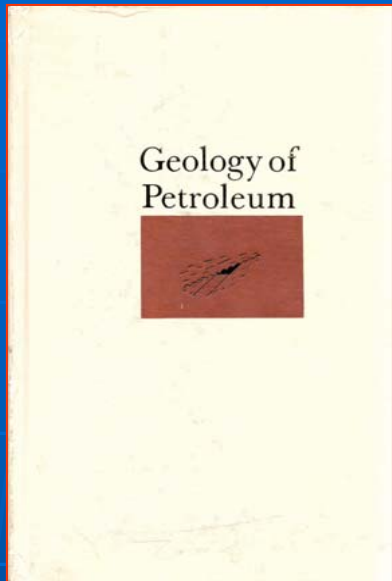


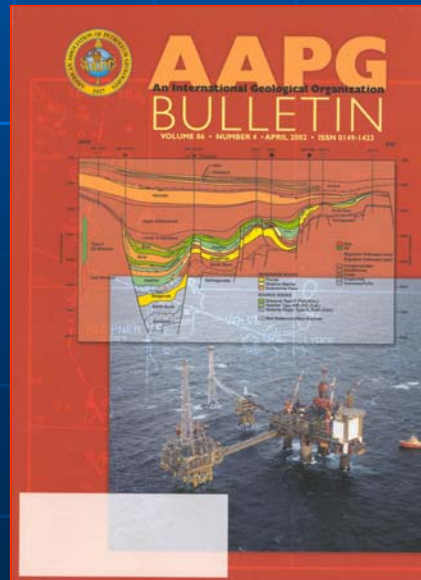
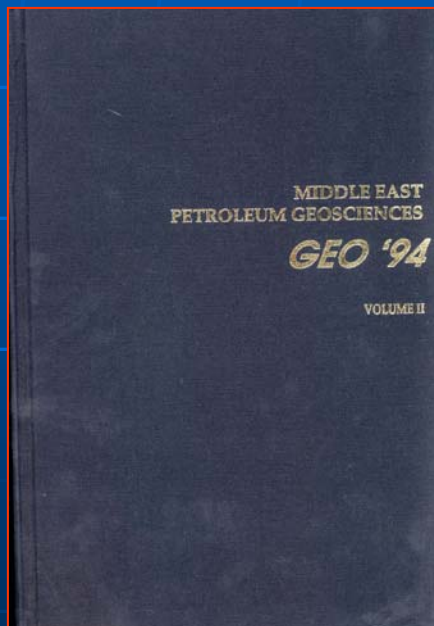
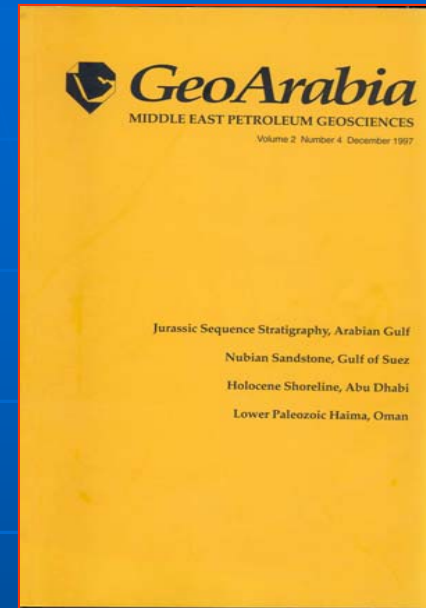
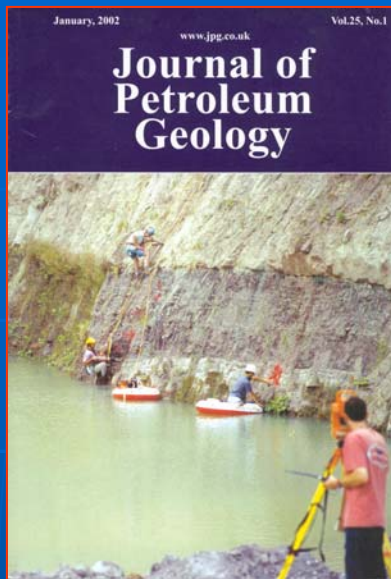
Petroleum Geology Resources

Main sources

- ✓ **Bibliographies, Abstracts, Indices**
- ✓ **Textbooks of petroleum geology**
- ✓ **Journals and periodicals for petroleum geologists**
- ✓ **Geological journals of direct concern to petroleum geologists**
- ✓ **Vital petroleum periodicals, not geological**
- ✓ **Short-article periodicals**
- ✓ **Standard geological periodicals or series**







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Journal of SEDIMENTARY RESEARCH



Section A: Sedimentary
Petrology and Processes

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