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November 22, 1966

C. H. KEPLINGER

Keplinger and Associates, Tulsa  
*"Interim Report on the Use of Steam to Increase Oil Recovery"*

Utilization of steam has found its greatest economic application, as of now, in the state of California.

Ten fields accounted for a net increase of 33,800 barrels per day. During 1964 the greatest increase in production was from the Midway-Sunset area. During 1965 production of heavy oil by steam injection had risen at an astounding rate.

Outside the state of California there have been many steam injection projects inaugurated. Steam injection has been tried in almost every producing state in the union. Several steam injection projects were in operation during 1965 in the state of Pennsylvania. Both Illinois and Indiana had steam projects in operation. Several steam injection projects were also in operation in the states of Arkansas, Texas, Oklahoma, Kansas, and Wyoming.

The theory of what happens during a steam soak process is not entirely understood at this time. The main object of steam injection is to increase the temperature of the oil and reduce its viscosity. Based upon information from individual wells which have been stimulated and produced by the so-called huff and puff method, it is evident that the increased production is, in part, due to the resulting radial improvement of oil mobility within the formation around the bore hole.

Equipment suppliers have furnished oil operators a number of different thermal recovery heaters to choose from and in a variety of sizes. The most popular design is the forced circulation once-through steam generator. The units are designed to produce steam of approximately 80 per cent quality and up to 3,000 psi pressure. The mechanical design of most heaters consists of a radiant section and an economizer section. The heater and all the accessories can either be skid or trailer mounted.

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November 28, 1966

DANIEL F. MERRIAM

Kansas Geological Survey,  
 Lawrence, Kansas

*"Use of Computers by Geologists"*

Computers now are being used by geologists to aid in the exploration and exploi-

tation of natural resources. Many statistical techniques easily can be utilized with readily available third-generation machines. Trend analysis, correlation methods, and classification procedures are used routinely to help in solving many geologic problems. As computer programs and quality data become available undoubtedly these tools will be used more and additional ones will be developed. It should be obvious that the use of computers is not expedient in all instances, but is especially applicable for manipulations which are performed many times or to unravel extremely complex situations. The potential of the computer is not yet realized, but involvement with them is creating a "new way of life" and certainly effecting change. This change is being felt in science as well as social and economic aspects of our everyday life.

Trend Analysis	Correlation Methods	Classification Procedures
2D, 3D, and 4D trend analysis	auto- and cross-correlation	matching coefficients (including similarity, correlation, distance, and cosine-theta)
harmonic analysis (includes Fourier series, power-spectrum analysis)	auto- and cross-association	PCA (principal component analysis), factor analysis, and cladistic methods

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December 15, 1966  
WILLIAM E. HAM

Oklahoma Geological Survey, Norman  
*"Reefs and Stromatolites"*

Sediments of limestone depositional environments are uniquely rich in the secreted skeletal carbonates of marine organisms, clearly attesting to the great importance of animal and plant life in the formation of most carbonate rocks.

By far the outstanding example of organic activity in any sedimentary environment is the construction of reefs or mounds that are built, distinctively and wholly, in response to a localized intense concentration of organisms. The structures thus built are irregular in shape and size, and are typically massive in gross appearance, lacking the stratification or bedding of the surrounding sediments. The specialized environment at the reef site is above-all characterized by a distinctive abundance

of organisms, general absence of bedding, and an implied but invariable concept that the upper growth surface of the reef lies above the surrounding sediment floor. Differences in the magnitude of growth relief distinguish between reefs on the one hand and mounds or bioherms on the other. Both types are valuable in providing reservoir rocks for petroleum, but in entirely different ways.

Stromatolites likewise are manifestations of intense organic activity. They are bedded layers that consist generally of laminated carbonate sediment entrapped by blue-green algae. These layers, normally not exceeding 5 or 10 feet in thickness, are interbedded with other kinds of limestones and are a common element of many stratigraphic sequences. They are valuable as indicators of the intratidal or extremely shallow-water-marine environment, but in spite of their complete dependence upon organisms, they play no role as reservoir rocks in the entrapment of petroleum.

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January 9, 1967

JOHN P. OLSON

Standard Oil Company, Indiana  
*"Why Geologists Should Understand Computers"*

The electronic computer is potentially one of the most powerful tools that has been presented to the geologist. In order to use this tool to supplement his experience and imagination the geologist will have to learn to understand and communicate with it.

If geologists do not learn to control the computers, they are apt to lose control of geologic exploration. The persons directing the application of computers to geology must understand both the computer and geology, or both time and results are lost in continual translation and interpretation.

There is currently a shortage of computer programmers which is getting steadily more acute. In order to realize the potential benefits which are available with the computer, geologists will have to learn to do at least some of their own computer programming and analysis. In the process they will find that it is a lot of fun.

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January 12, 1967

PAUL L. LYONS

Sinclair Oil and Gas Company, Tulsa  
*"Gravity Interpretation of Major Crustal Properties"*

Gravity and magnetic maps, large in