Finding the Undiscovered Petroleum of the Circum-Pacific

John M. Parker
Consultant
Englewood, Colorado

I start with three premises: First, there are ample undiscovered petroleum, oil, and gas to maintain present rates of production in the greater circum-Pacific area for 10 years or more. How do I know this? In the last 5 years, new discoveries and successful development wells have been and are being drilled that will replace the normal declines of production in older fields. The exploration process must continue over long periods of time to be most successful. A long period of time in this context is 20 to 40 years.

Second, the cost of discovering and producing this petroleum will be competitive with other energy and chemical building-block sources.

Third, this petroleum will be superior to other energy sources in convenience, in lack of major environmental problems, and in maintaining or increasing standards of living.

This third premise applies to the major island and continental areas and to the major population centers. It may not apply to isolated or to low-population-density areas.

Given the above premises, what must happen for this vast amount of petroleum to be found? Four things are necessary; brains, money, labor, and time. I will talk about each of these separately.

First brains. Put yourself on a spaceship; you are looking down at the Republic of the Philippines and at the rest of the vast Pacific basin. You will see a view like this (Figure 1).

This map (Figure 2), which is made from geologic brain power, shows 188 known sedimentary basins as of 1978 in the circum-Pacific area. Productive basins that contain at least one giant oil or gas field are colored pink, basins containing only subgiant fields are colored green, and basins that are unproductive to date are shown in yellow. A giant oil field is defined for this map as one containing 500 million or more barrels of recoverable oil; a giant gas field on this map contains 3 trillion or more cubic feet of recoverable gas. Assuming that 6,000 cu ft of gas is the energy equivalent of 1 bbl of oil, a field of 3 Tcf of gas is equivalent to an oil field of 0.5 billion bbl (500 million bbl of oil equivalent). The circum-Pacific area shown here has twenty-four basins with giant fields, forty-four basins that produce from subgiant fields, and 146 basins that are, so far, unproductive.

There are 575 known basins in the world; 215 of them produce, and seventy-five of them contain one or more giants along with smaller fields. There were 390 giant fields in the world in 1978. A few more have been discovered since then. Thus, the circum-Pacific area's 146 unproductive basins compare to 214 unproductive basins in the rest of the world.

The same base map is repeated here (Figure 3), showing how many AAPG members there are working in the circum-Pacific area. The total number is about 3,507, which is not nearly enough to find the oil and gas in this area that the world needs.

California has 2,416 members; it is economical to explore for small fields there, so 2,416 men and women are doing just that. Fiji has three members, Tonga has one; the People's Republic of China has three members. The People's Republic of China probably has hundreds, if not thousands, of geologists who...