

Evans's *Three Men* will be both illuminating and disturbing.

Mrs. Evans has made three personal and factual studies, one of a man at war with society, one of a man whose dreams are an escape from society, and one of a homosexual. She has broken down the life of each into its sound and unsound elements, from the imagined slights of childhood to the very real ones inflicted by an unthinking adult world. Then, in short follow-up studies, she shows us the men as they are today, struggling both with themselves and their environments, tragically aware of their shortcomings and striving, so often fruitlessly, to overcome them.

But this is not a psychological textbook. It uses no jargon, neither has it the specifically clinical approach of the case-history. Mrs. Evans has sub-titled her work, "A Study in the Biography of Emotion," and biography, in the best literary sense, it certainly is. Moreover, by being biography it is able to achieve more than a textbook ever could. It allows us to understand the means by which the emotional attitudes dominating each of these men flare up in the type of behaviour that we call anti-social. We are allowed freely behind the scenes in each subject's mind, and if we have a farthing's worth of compassion we can feel, with them, the stresses that build up and build up until, under the present-day restrictions of society, they become intolerable.

This is a profoundly uncomfortable book, not only because it shows by what a hair's breadth normal behaviour is separated from abnormal, but also because it can suggest no way in which that hair's breadth can be made more substantial. It draws no conclusions, save the one that is implicit from the first page to the last, which is that until society is prepared to come to new and more humane terms with its misfits, misfits can never come to terms with it.

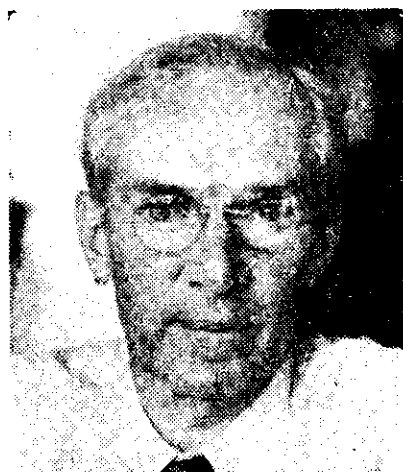
—Peter Cape

STRICTLY PERSONAL

A PERSONAL JESUS, by Upton Sinclair; George Allen and Unwin. English price 12.6.

EACH individual believer and unbeliever has no doubt a different conception of the humanity of Christ, his appearance, his character and activities beyond that limited survey which we derive from the Gospels. It is a strong temptation to each of us to make Him in our own image. To one who is in the strict sense a believer the accuracy of his private image is not of prime importance; but it is all-important to one

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UPTON SINCLAIR
Love strained through a political sieve
N.Z. LISTENER, APRIL 1, 1955.

Drilling Technique

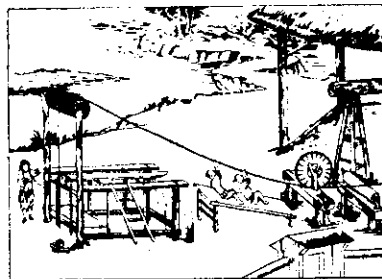
The art of drilling is very old. In China as far back as 221 B.C. brine wells were being drilled to depths of 3,500 feet to obtain salt.

Chinese Pioneers

For their salt wells, the Chinese used a heavy chisel-shaped bit attached to a rope and operated by manpower. The bit was regularly raised and dropped in the borehole. The earth and stone broken by the bit was scooped out and by slow degree a practically vertical well was bored. As the bit went deeper more rope was payed out. This early method of drilling was the forerunner of what some 2,000 years later came to be known as the percussion or cable system, used almost exclusively in oil well drilling in the nineteenth century, and still used for wells of no great depth. Mechanical power was substituted for manpower, a cable or series of rods replaced the rope, but otherwise the percussion system bore a remarkable resemblance to its Chinese prototype of centuries earlier.

Circulation Drilling

As the petroleum industry grew, new methods were introduced. In its fields in Indonesia Shell developed what was called the circulation method by which a stream of mud flush was forced through the hollow tubular rods and bit. This flush—a mixture of water and clay—cooled the bit and carried to the surface the earth and stones broken loose by the bit. This system maintained

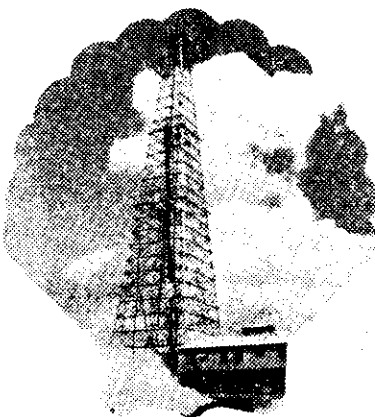


its supremacy over older methods for a long time.

The ever-increasing demand for petroleum and its products, however, led to the exhaustion of the shallow oil sands. The need for deeper drilling became urgent. A new method was evolved.

Rotary Drilling

The introduction of the rotary system made possible rapid advances in deep drilling techniques. As



the name implies, the rotary system bores through the rock strata. The bit is fastened to hollow, rotatable drill pipes which, with the aid of powerful engines, are given a rotary movement from the surface level. With the help of this now generally used system previously inaccessible oil-bearing strata can be reached and can now contribute to satisfying the increasing demand for this vital mineral.

This is strikingly illustrated by the fact that in 1919 rotary drilling equipment could penetrate only the softer formations, and then only to a depth of 3,000 feet. In 1933 the deepest well in the world reached 10,944 feet. Today oil is sought at depths which sometimes exceed 3 miles—depths impossible

Left: How the Chinese drilled.
Above: A Shell floating derrick on the Mississippi Delta.
Right: A modern telescoping derrick used by Shell in California.

to reach by percussion drilling methods.

Nature has not been considerate in the location of oil fields. The majority outside the United States are found in tropical jungles or desert wastes. In many cases the search for oil has to be preceded by aerial surveys for map purposes. Only then is it practical to start a scientific search involving—field geology; gravity survey; seismic surveys; corehole drilling and finally full bore test wells. Each of these processes is itself a science, its use being to amplify or cross check the conclusions of the others.

But even when a structure of promising appearance has been mapped and fully investigated at the surface there is no guarantee that it will be oil bearing. For no way has yet been found to determine whether oil is actually present, except by drilling wells. Failures every year represent a write-off of tens of millions of pounds, abandonment of many hundreds of thousands of acres of concessions and many hundreds of miles of roads whose construction is the usual prerequisite of drilling.

Shell employs a specialist staff of scientific workers whose job it is to solve the many problems arising from oil well drilling. In this way it is making its contribution to the continuing development of the petroleum industry.

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