

The ARCHIMEDEAN PRINCIPLE
A new enunciation and interpretation and its
applications in modern technics

By Dr. Eng. Ion BASGAN

In his struggle to discover and conquer nature's forces, man first penetrated the lithosphere to extract oil, then used this to ascend in the heights of the atmosphere and of the cosmos.

Nowadays progresses, whereas the conquest of the lithosphere marched at a rather slow pace, being opposed by the specific gravity of the rocks and, in liquids, by the upward archimedean pressure.

The conquest of the underground has met with great industrial and technical developments in the period which followed the first world war. At that time the author, a roumanian engineer, first realized the importance of the archimedean principle in oil-well drilling. In his long drilling practice in roumanian oil-fields, he conceived that the archimedean pressure plays a most important part in underground drilling within a liquid, particularly so in very deep wells and making abstraction of the laws of tradition, science and technic of those times. The autor succeeded in discovering the effect of the archimedean pressure on drilling strings (the Basgan effect).

He thus discovered the neutral and compressed zones in the drilling strings and succeeded in inventing modern drilling methods such as drilling with proportionately heavy drill-collars and the simultaneous rotary and percussion drilling, for which inventions he obtained patents as well in Roumania as in the United States.

The scientific discoveries related to archimedean pressure gave place to scientific controversies almost everywhere in the world.

Is there or is there not a neutral and a compressed zone in the drilling string operating in the liquid?

Can the archimedean pressure cause bending of the drilling string in the static case and more particularly in the dynamic one?

These are the problems which incited discussions and controversies in Roumania and elsewhere in the world.

Is there any possibility of transmitting energy from the surface, by sonic waves, through the drilling string to the bit? This is the second question.

Modern researches require drilling up to depths of 10 and even 15 thousand meters in order to reach the Mohorovici limit. Drilling must overcome the specific gravity of the rocks and the archimedean pressure.

The effect of the archimedean pressure on the drilling string must be limited to the drill-collars. This principle together with the possibility of producing supplementary energy on the bit through sonic waves constitute the ways of the future in the technology of oil-well drilling.

These are the problems which the autor is dealing with in his work now being edited in Rome, in English, under the auspices of the <<European Foudation Dragan>>.

The volume, in 300 pages, has the following chapters:

CHAPTER I. The ARCHIMEDEAN PRINCIPLE: Archimedes and the circumstances in which he discovered and enounced his principle in science; apparent weight; Commemoration of Archimedes in the twentieth century.

CHAPTER II. DISCOVERIES and the NEW ENUNCIATION and INTERPRETATION of the ARCHIMEDEAN PRINCIPLE: Circumstances which favoured and determined the new enunciation and interpretation of the principle of Archimedes; discoveries in the period 1926-1933; point of application of the archimedean force, compressed zone and neutral zone, the Basgan effect; the new enunciation and interpretation of the archimedean principle; transmission of energy by sonic waves through the drilling string.

Chapter III. PRATICAL APPLICATIONS AND PATENTS: Drilling with proportionately heavy drill-collars; simultaneous rotary and percussion drilling – sonic drilling; roumanian patent no.22789; U.S.A. patent

no.2103137; applications in general technic.

CHAPTER IV. PUBLICATIONS and COMMUNICATIONS to the ROUMANIAN ACADEMY, INSTITUTIONS and WORLD CONGRESSES: Roumanian Academy; Montanistische Hochschule leoben, Austria; World Petroleum Congresses in London (1933) and in Paris (1937); various scientific associations and institutions in the oil branch.

Chapter V. scientific controversy and evolution of opinions in roumania: Prof. Eng. Dionisie Germani; Prof. Aurel Beles, member of the Academy; Prof. V. Valcovici, member of the Academy; other opinions.

CHAPTER VI. EVOLUTION of OPINIONS in the WORLD: Research and documentation of Eng. Dan Bodnarescu of the Petroleum Research Center of Bucarest; Murray F. Hawins and Normand Lamont, U.S.A.; Best M.D. U.S.A.; Moor, U.S.A.; Bernhard, Paris 1946; Vozdvijski, U.R.S.S. 1949; Gerhard Kuhne and E. Wolf, German Federal Republic; AGIP, Italy.

CHAPTER VII. APPLICATIONS: Applying proportionately heavy drill-collars and sonic methods in drilling technics; applications in Roumania; applications elsewhere in the world.

CHAPTER VIII. Conclusions.

BIBLIOGRAPHY.

The volume contains a foreword by Prof. Renato Calapso of the Messina University, President of the «World Committee for the Commemoration of Archimedes in the twentieth century». In his foreword Prof. Calapso says:

«With great pleasure I see how the lively and «passionate work of Dr. Eng. I. Basgan brings a «new contributes to a noteworthy progress of one «aspect of the scientific production of the great «syracusan.

«I am really proud of being able to assert that «our commemoration of Archimedes in the «twentieth century (and the five symposia which I «organized in this connection in Syracuse «beginning with 1961) have contributed in directing «many distinguished scientists of all nations towards the ideas of Archimedes.

«To these belongs dr. Basgan, who must be «praised for his new ideas-in truth somewhat daring «new merits to our great fellow citizen.

«And Dr. Basgan is truly a worthy follower of «Archimedes, because he follows his fundamental «idea of usig for the benefit of humanity and for its «welfare, all realizations and intuitions of a «scientist's genius. In the present case it is not a «matter of arid and intuitions which have been «proven by reality.

«I therefore wish to Dr. Basgan a most happy «conclusion of his studies, which he initiated under «the best of auspices i.e with the fervency, the «enthusiasm and the decision, but above all, with «the ideas of the great syracusan ».

The volume will be shortly on sale in technical book shops and can also be orderd at the «European Foudation Dragan», Piazza Foro Traiano no.1-Rome (Italy).

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