NOTE. — Because of similar friction, the "Lead Shot Buoy Spacer" naturally assumes the position of the real drag. For sections 200 feet or less it would appear that the spacing of shot would be too close for proper manipulation; in which case a celluloïd spacer should be used. Since on regular drag work sections less than 300 feet are seldom used this is of small consequence.

While anything that tends to facilitate the plotting of the drag work and increase its accuracy is highly desirable, too much reliance should not be placed in the delineation of bights of drags in so far as coverage is concerned. Whenever a matter of importance arises in connection with drag work, a safety factor must be applied and the bight of the drag assumed in the position of least coverage.

A MARINE CORING INSTRUMENT - ITS CONSTRUCTION AND USE.

by

FRED M. VARNEY, UNIVERSITY OF CALIFORNIA, LOS ANGELES

(Extract from an article in the *Transactions of the American Geophysical Union*, Washington, August 1935)

A bottom-sampler for procuring cores several feet long has been developed recently. Designed for use on the 34-foot ketch *Queequeg*, this instrument had to be light, inexpensive, operated with ease by a three-man crew, effective in deep water under various conditions of wind and sea, and of a type that could be handled with a light winch and light cable. The sampler consists essentially of a light cylindrical core-barrel that is held upright on the sea-bottom by a float, and is driven into the mud by a streamlined lead hammer, which slides along the core-barrel.

A folding tripod-support for the core tube was successful in an experimental model, but proved unwieldy when built to full size. If a vessel large enough to carry a cargo-boom were available, this difficulty would probably not be encountered. A float-support was considered as an alternative. It became evident that the core-tube should be independent of the float, and that the float should be held submerged by weights resting on

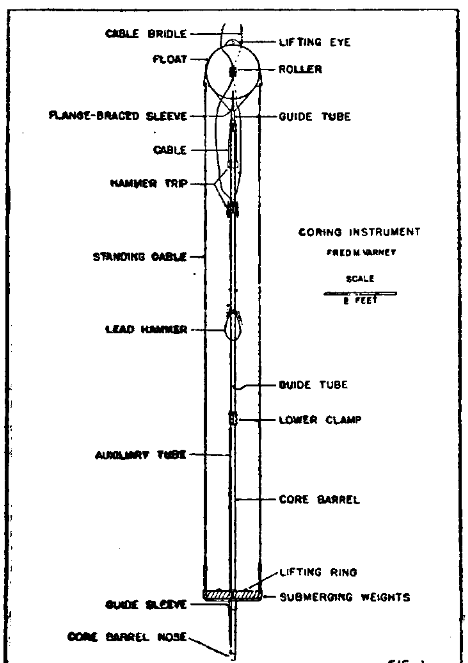

FIG. 1

the sea-bottom. A device of this type was built with a cylindrical float at the top of a long wooden frame weighted at the bottom, the frame serving as a track for guiding the core-tube. A hammer slid on the tube and was operated with the same cable that lowered the instrument to the sea-bottom. The instrument was modified during the course of ten offshore coring trips. In spite of makeshift construction, it took satisfactory cores five feet long in water 200 feet deep. It was not possible to core at greater depth because of the collapse of the float.

An instrument designed to take cores in water 3500 feet deep is now being constructed (see Figure 1). The float, cast in an aluminium alloy, is an 18-inch sphere with a buoyancy of 65 pounds. Bosses on its sides are machined to receive both rollers for the running cables and shackles for the standing cables. A flange-braced sleeve cast integral with the bottom of the float, grips the end of a guide-tube on which the upper part of the core-barrel slides. The core-barrel is a steel tube 15 feet long and 1.5 inches in outside diameter. The hammer, tripped to fall free of the cable, has a stroke of 6.5 feet; it pounds against a clamp bolted around the core-barrel. The two submerging weights, half discs of iron, are connected with the float by standing cables. To ease the handling, the weights are lifted on and off while the instrument hangs alongside the boat in the water.

An important and effective feature of the instrument is the small-bore auxiliary tube, which eliminates suction during the core-barrel's withdrawal from the sediments. It is kept closed while the core-barrel is being driven into the sediments, but opens and lets water into the potential cavity below the barrel, as the barrel is drawn out. This device reduces greatly tension on the cable while the core-barrel is being withdrawn, and renders a catch or valve unnecessary for retaining any but very loose cores.

The cable for operating the instrument is 5/32-inch galvanized airplane strand. It is wound on a hand winch supplied with a quick-acting clutch and a brake of large area. For work at depths greater than 1000 feet, however, a motor-drive will be necessary. As the motion of the boat jerks the cable dangerously and interferes with the hammering action, the cable should be run over a sheave mounted on a spring-suspended boom. Alternate heaving in the cable by hand and suddenly slacking, has been the method of hammering. This has not been very satisfactory, and in the future, with the aid of the hammertrip, th e cable will be managed entirely cn the winch.

The weight of the assembled instrument in air is 200 pounds; as handled on the boat's halyards without the submerging weights, it weighs 130 pounds; in water it weighs about 70 pounds. The total length is 17 feet. When the instrument is dismantled, all parts but the core-barrel can be stowed below deck.

The preliminary work was begun in September 1934 under the direction of Professor U.S. Grant of the Geology Department, University of California at Los Angeles. The work is being continued with the help of a research grant to the writer from the Committee on Sedimentation of the National Research Council.

It is hoped that in another year more detailed information can be published on the operation of the instrument and on the nature of the subsurface sediments in the Santa Monica Basin.

THE MOUNTBATTEN RULER FOR CHART WORK, ETC...

The following information was communicated to the Bureau by Commander Lord Louis Mountbatten, K.C.V.O., R.N., at the time of the visit to Monaco of the British Destroyer *Wishart*. More complete details concerning this interesting instrument are given in a small pamphlet published by the makers, Messrs Elliot Brothers Ltd., Century Works, Lewisham, London, S.E. 13.

ADVANTAGES :

In the days when courses and bearings were laid off with regard to the varying Magnetic north, the nearest magnetic compass rose on the chart was selected, in order to approximate as closely as possible to the Variation at the place concerned. A parallel ruler was then necessary to transfer the course or bearing to the desired position.

Now that the unchanging True north is used as the datum for laying off courses and bearings, it is possible to simplify the process by transferring the true compass rose to the desired position, by means of a transparent protractor ruler, using the nearest parallel of latitude or meridian of longitude as a datum line.