

obliquely transverse serrated ridge near its base on the dorsal aspect. This very striking feature has not been referred to by previous authors.

The authors are very thankful to Shri T. Tholasilingam, Fishery Scientist, for his encouragement and suggestions for improving the manuscript.

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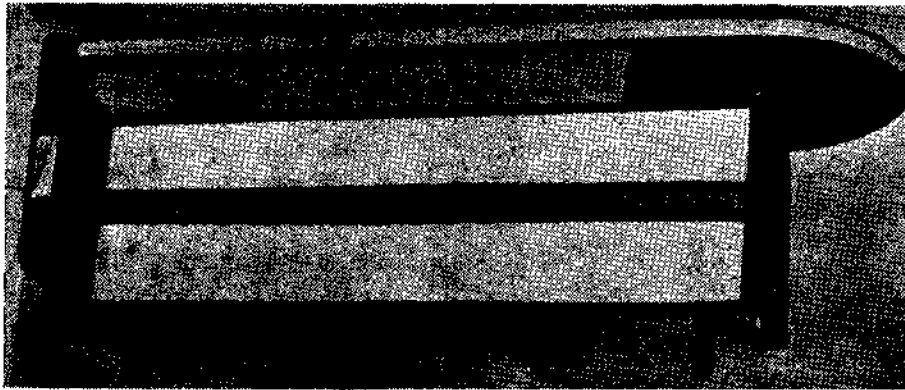
A FISH MEASURING BOARD FOR RACIAL INVESTIGATIONS

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To measure the linear dimensions other than the total length of a fish for racial investigations, a board is designed and got fabricated. It has a mirror base and a half metre scale. There is a grooved wheel and two pulleys at its back, carrying a steel tape with a needle wire fixed at its zero. When the wheel is rotated the tape runs from left to right and the needle rides over the fish on the board. The tape gives the measurement and the rider helps to pin-point it avoiding parallax error. The board is waterproof, inexpensive and easy to make.

The total length of a fish, like the mackerel or oil sardine, is measured after flexing the tip of its longest tail lobe in line with the snout and caudal peduncle over the scale on a measuring board having a head-piece. Measurements such as the fork length and the standard length lying in the median axis of the fish can also be done on such a board. However, various other parameters like the length of snout, diameter of eye, head length, etc. which do fall in this line but cannot be seen on the scale over which the fish lies; and other lengths from the snout to the origin of different fins which are not in line with the median axis, cannot be taken on it. These measurements which are highly necessary for racial investigations are to be parallel to the median axis of the fish, and are usually done either with dividers and scale or vernier caliper. With the dividers the error of oblique measurements radiating from the tip of snout to the different points of the fish can creep in. The readings on the vernier caliper also become erroneous if its longitudinal arm is not held parallel to the longitudinal axis of the fish. Moreover, measuring a fish with these instruments involves too much handling of it, which may spoil the specimen as well as the fingers by formalin as only preserved material is usually used for racial investigations. To avoid these and at the same time to guarantee accurate, quick and easy measurements, a fish measuring board shown in the following photograph is designed and got locally fabricated.



The board is 55 cm long, 15 cm broad and 12.5 cm high and is made of 2 cm thick etak wood plank. A half metre scale with millimetre divisions is placed longitudinally in the centre of the board. On either side of it are 2 long mirrors. The head-piece is 9 cm tall. The entire board in view is covered with perspex sheet which is colourless and transparent over the scale and mirror. The scale and mirror are hermetically sealed from dust and dampness.

At the back in the right, the board has a wheel of 20 cm diameter and 2 cm thick perspex; and at the right are 2 pulleys. One of the pulleys is fixed at the same level as the wheel. The other is above it on the back of the head-piece, and is covered from view on top by a piece of perspex sheet jutting over

it. The upper periphery of this pulley and that of the wheel are at the same level. A steel tape made into a belt by joining its ends together is put tightly in the groove of the wheel and the pulleys. To avoid slipping and slacking the tape is screwed to the wheel on top, its zero exactly at the zero of the scale. The axis of the wheel passes through the board and comes out in front where a handle is fitted. By turning this handle the wheel is rotated and the tape slides over the back of the board.

To this sliding tape at its zero is fixed a 15 cm long stainless steel needle indicator which rides over the full width of the board when the wheel is rotated. As the rider moves on to the right, the graduated tape at left emerges into view and automatically gives the reading. The scale on the board meant for measuring the total length is redundant here and the strain of reading it without parallax error is totally avoided. However, as the tape is screwed to the wheel, it cannot rotate full circle. In fact, it does only half circle and the rotation pulls out 36.5 cm of the tape into view though the board measures 50 cm in length. This restricted movement of the tape has its added advantage. The rider on the tape can never run over the grooved wheel at right and get spoiled. Similarly with the zero at the left of the board the tape cannot go anticlockwise, jamming the indicator needle in the pulley and head-piece.

The measurements are taken on the left side of the body, with the fish lying straight on its right side, the mouth closed and the snout pressed gently against the head-piece of the board (FAO|UN, 1959). By rotating the wheel the rider is brought over the fish at the desired spot accurately, avoiding parallax error viewing the reflexion of the indicator needle on the mirror. The steel tape which also moves with the rotation of the wheel gives the correct reading of the length at left. In fishes where the lower jaw is longer, the measurements are got by applying corrections for the length in front of it.

The F. A. O. has recommended a board with a mirror top and only a cursory rider for morphometric studies (Laevastu, 1965). Adjustment of the rider and reading the scale are difficult to accomplish in this. However, with the introduction of the sliding steel tape on the rotating wheel and pulleys in the new board, the work is simplified and made easy.

Made of teak wood and perspex sheets the board costs Rs. 150|-. With wood alone it may be much less. It has no complicated mechanism, and can locally be made at a good workshop.

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