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JULES VERNE AT THE 1964 NATIONAL EXHIBITION

Underwater research carried out over the last few decades by Professor Auguste Piccard and his son Dr. Jacques Piccard will enable the 1964 National Exhibition in Lausanne to offer its visitors a spectacular new attraction that even the famous Captain Nemo, born of Jules Verne's imagination in *20,000 Leagues Under the Sea* almost a century ago, would not have disdained.

On the basis of experiences made in the bathyscaphe "Trieste", which permitted the Piccards to dive as deep as seven miles under the surface of the ocean in the Marianas Deep, the two scientists were able to develop a new type of underwater craft. Baptized the "mesoscaphe", it is as its Greek name indicates, specifically designed for medium-depth exploration. But the mesoscaphe will not be used only for scientific research — it will have the honour of becoming the world's first tourist submarine. From the portholes of the mesoscaphe visitors to the 1964 Swiss National Exhibition will be able to see the depths of Lake Geneva with their very own eyes.

The Piccards' invention can most simply be described as a steel frame cylinder, much lighter than water, reinforced by inner strutwork and capped with a steel hemisphere at each end. The steel framework is designed to resist the maximum pressures to be found at 1,000 feet depth with a very high security coefficient. Even when the mesoscaphe is fully equipped and loaded — motors, batteries, projectors and all other equipment — and occupied by a full complement of crew and passengers, it will still be lighter than water. At each dive several tons of ballast — water and scrap iron — will be added to give it a specific weight just barely *lighter* than that which would make it sink of its own accord. In other words, the mesoscaphe will be able to submerge only with the aid of its propulsion motors and with depth fins adjusted to the proper angle. If the motor stops, the mesoscaphe will surface automatically.

The iron ballast will be held on to the mesoscaphe by electromagnets; in order to surface rapidly, the pilot need only cut the current — this automatically neutralizes the magnetic field and jettisons the ballast.

The system of ballast secured by electromagnets is the infallible safety device invented by Professor Piccard and found on all the bathyscaphes now in use. The water ballasts can also be emptied under water to make the vessel surface more rapidly. In all, the mesoscaphe will have four different systems, each independent of all the others, to assure its surfacing. Two are mechanical: motor propulsion and compressed air; two, non-mechanical and purely passive: stopping the motor and jettisoning the ballast.

If anything should go wrong with the electrical system of the bathyscaphe the magnetic field — created by electromagnets — would fall away and the engine would come to the surface of its own accord. As you see, a mesoscaphe excursion to the bottom of the lake involves less risk than the most innocent little car ride today.

Jacques Piccard's mesoscaphe will be equipped with the same system capable of assuring a constant provision of fresh air for 48 hours as was used for the bathyscaphe "Trieste". It will also be fitted with radio-television sending and receiving equipment and outfitted for night dives.

The interior of the mesoscaphe will be divided into two principal sections: a cockpit, for the pilot and a hostess, and a cabin for forty passengers. Two doors will provide access, one fore and one aft of the cabin. A porthole with wide-angle panoramic view will be placed beside each passenger at the proper height to give him an excellent view of the underwater landscapes.

The mesoscaphe's base will be in the pretty new small-craft port being built by the City of Lausanne, at the point of the jetty which, during the Exhibition, will be covered in order to house several restaurants. Its port terminal will have a surface area of some 300 square yards and is to include a small technical area and maintenance shop, ticket counters, various passenger facilities and the landing bridges designed for easy access to the mesoscaphe.

The mesoscaphe's underwater tours will, in general, all follow the same itinerary, expected to last about 35 minutes. About half the given distance will be covered on the lake surface. Once submerged and near the lake floor, the engine speed will be reduced to enable passengers to observe the underwater scenery under the best possible conditions. Projectors above each porthole will be angled to provide an aureole of light all around the mesoscaphe. The surfacing area will be clearly demarcated by buoys and, obviously, strictly out of bounds for all other navigation. A surface safety patrol will be on duty during the whole time of each dive.

Since the mesoscaphe is to be based in the port section of the Exhibition, a section which will be particularly animated and lovely under multicoloured lights after sunset, it seemed natural to provide visitors with the opportunity of a moonlight underwater cruise. The mesoscaphe's schedule calls for tours continuing right up to closing time in the evening.

The question of visibility at the bottom of the lake led the organizers of the Exhibition to get in touch with Dr. Otto Jaag, Director of the National Water Planning and Protection Institute. Mr. Piccard also suggested that Mr. Matthey, chief chemist of the Canton of Vaud, take samples of lake water at different depths, from the surface all the way down to the bottom, at different times of the year. This testing was carried on throughout 1962 and the cantonal chemist reported that the lake water, sometimes cloudy near the surface, becomes clear as crystal in depth, a clearness that is practically invariable from one season to another. The underwater tourists can expect to find excellent visibility at mesoscaphe depth.

The initiation to submarine life will provide visitors to the National Exhibition with an unforgettable experience. But the marvellous machine perfected by Jacques Piccard is more than just a tourist attraction. As you know, the National Exhibition has itself a number of cultural goals besides its more purely recreative aims. The mesoscaphe, ready to be used for scientific research in oceanography after the Exhibition closes its doors, fits into this programme perfectly. But it will have an occasion to prove its scientific mettle long before the end of the Exhibition. The qualities of the mesoscaphe will make it possible for Mr. Piccard to offer an extraordinary opportunity for research under the surface of Lake Geneva to a number of specialists who will first use it for underwater scientific study projects in its own home waters.

(Expo 1964 Information Service.)