

A JET PROPELLED LIFEBOAT.

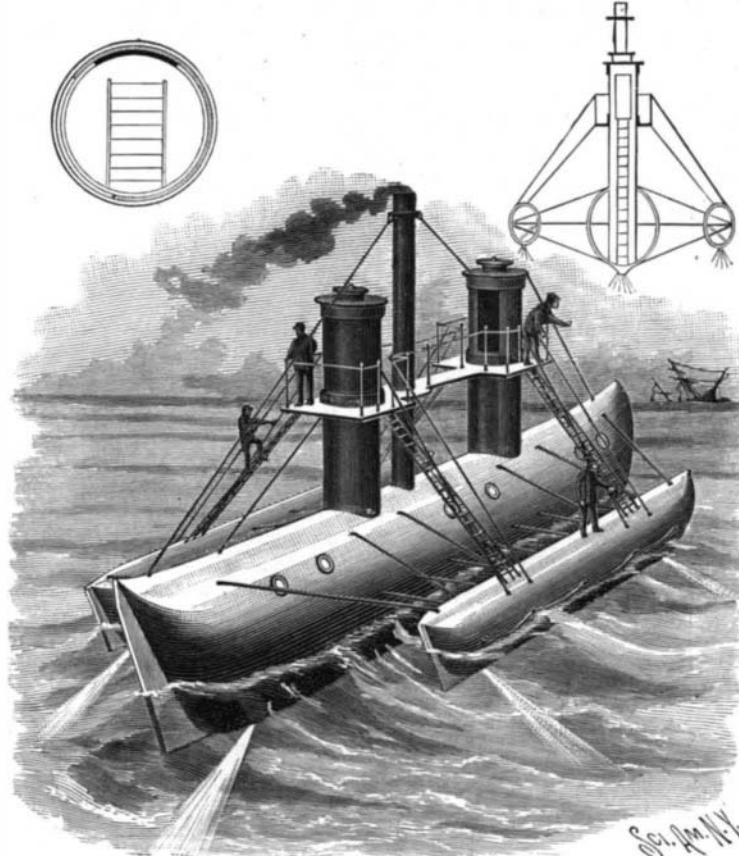
The illustration represents a lifeboat of strong and simple construction, arranged to be propelled by means of jets discharged either forward or backward, and provided with substantial floats rigidly connected with the hull on each side to hold the boat steady and break the force of the waves. This boat forms the subject of a patent issued to William F. James, of Denton, Texas. One of the small figures is a sectional view of one of the revoluble hatches, of which the boat has two, and the other is a cross section of the boat on the line of its front revoluble hatch. The central hull has bulkheads forming five watertight compartments, of which the middle one is used as an engine and boiler room, while from the two adjacent compartments ladders extend up into outlet towers, closed at their upper ends by revoluble hatches. Each of these hatches opens on a platform supported above the deck, and ladders lead from the platform to the top of the floats. The propulsion of the boat is effected by means of a pump located in the engine compartment, by which water is drawn in centrally at the bottom of the hull, and expelled through pipes at its rear or front end, according as the boat is to be propelled forward or backward. This suction of a powerful pump in the center of the vessel is designed to materially assist in keeping the boat steady in the water. Similar pipes also extend from the pump to the front and rear ends of the floats, the vessel being steered either to the right or left by forcing water through one of the pipes in one of the sets, and the auxiliary pipes in the floats being also used when desired in the propulsion of the vessel forward or backward. Other pipes lead to openings in the sides of the floats, where their discharge is directed downward and outward, to assist to turn the vessel, to keep it from drifting on to a wreck or rocks, and to keep it from capsizing when in the trough of the sea. The pump is also connected by suitable pipes with the various compartments and the interior of the floats, to pump out water, should they become accidentally flooded. As the boat has no rudder or screw propeller, it is designed to stand the roughest weather without being damaged or disabled, and when the boat approaches a wreck the platform and hatches may be readily reached by those who are rescued, the interior of the central hull being then conveniently accessible.

The Inheritance of Acquired Characters.

Prof. Retzius has lately published an account of certain observations on the fetus of Swedes, which, in connection with similar observations recorded by Surgeon Havelock Charles on the Punjabite, he believes to support the Lamarckian view that acquired characters are inherited. He endeavors to show that the evidence in support of the theory is to be found in our own skeletons. Some years ago, Prof. Arthur Thomson pointed out that in certain races of men who habitually adopt a "squatting position," the tibia and astragalus present additional articular facets, allowing greater flexure of these bones upon one another than is possible (or at any rate normal) in Europeans and other civilized races who have given up squatting, and in which these facets are absent. Accompanying these facets there is a retroversion of the head of the tibia. Both these characters are present in apes and in certain prehistoric races, and Surgeon Havelock Charles described, a year or two back, a series of instances of their presence not only in the adult Punjabite, but in the fetus. At the meeting of the British Association at Oxford, Prof. A. Macalister exhibited these specimens, as well as similar specimens taken from British infants, and a discussion followed on the meaning of these peculiarities. Now Retzius ("Ueber die Vererbung erworbener Eigenschaften," Biol. Untersuch., N F. vii) records these same characters in fetal Swedes, from an early age, even up to eight months; and reviewing the facts, he comes to the conclusion—in which I think most of us would agree—that the presence of these characters, viz., the retroversion of the head of the tibia, and "Thomson's facets," is a more primitive condition than their absence in normal Europeans of the present day; that they have been inherited from early times; and in those peoples which habitually adopt the "squatting" position they have become gradually further developed. This last conclusion is per-

haps open to question; it is quite possible that even in these races they are less developed than in ancestral forms. But Retzius proceeds to contend that Europeans have undergone gradual change in their skeletons from generation to generation; they no longer sit on their haunches, and have gradually lost the power to do so, and as a consequence "Thomson's facets" have disappeared; and he concludes that "it is, therefore, we Europeans who, on account of changed habits, have undergone changes, and it is

the osteological peculiarities cease to be evident. Young children, as we know, can and do sit upon their haunches, and can move their legs and ankles in a way that an adult, unless he is fairly athletic, finds it impossible to do; and it appears probable that the disappearance of the facets in the adult is closely connected with the ossification of the bone, which will obliterate the facets now no longer brought into use. It would be interesting to examine in this connection the leg bones of "contortionists" and others who make a free use of their legs and ankles, for a very little practice enables even civilized men to employ exaggerated movements of their limbs. Another point to which attention might be directed (which indeed may have been looked into) is the character of the articulation of the bones of the great toe in those races which make use of this digit. A casual observation on the skeleton of an Andaman shows that the articular surface of the first metatarsal with the entocuneiform is distinctly more rounded than in a European—a feature in which there is an approach to the condition in the apes. It might have been presumed that some difference, similar to that in Europeans and Punjabites, would be found in digitigrade and plantigrade mammals; but the result of a brief examination of skeletons of such forms is sufficiently surprising to be referred to; for instance, in the lion there is a facet of the same kind as, but not really homologous with, Thomson's facet, at the lower end of the tibia. This is absent in the bear and the dog; it is absent in the sea otter. It is present, however, in the beaver and other rodents; it exists in some ruminants, as well as in the horse, but is only slightly developed in the tapir, and is absent in the Suidæ.—Nature.



THE WILLIAM F. JAMES LIFEBOAT.

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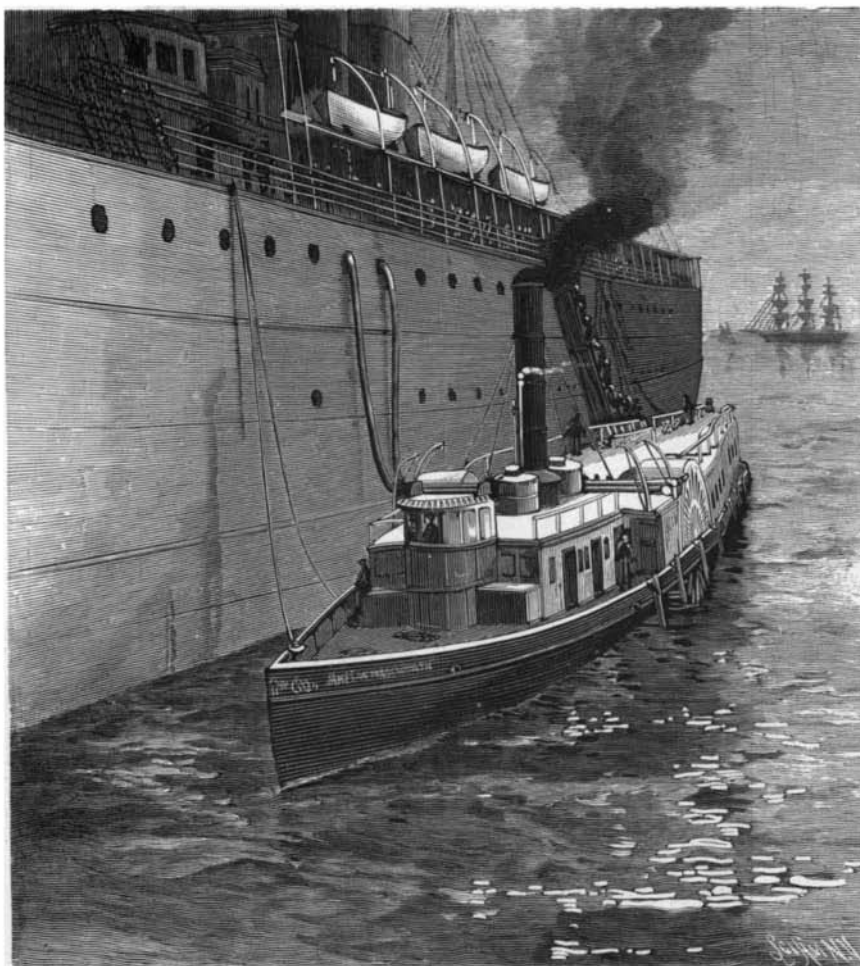
But here it seems to me that Darwinians would join issue with Retzius. His own and other observations show that the changes are not inherited; for the characters of the bones are inherited from the ancestral apelike forms, and it is, surely, only on account of individual habit that the peculiarities are not present in the adult. It is by no means clear what is the "acquired" character on which Retzius hangs his views. Is it the osteological peculiarity, or the habit of using chairs to sit upon, instead of employing the squatting posture? His own researches show that the osteological characters are not acquired, while the habit of walking upright and sitting on chairs is distinctly acquired, and it is in relation to this acquirement that

the administration of Dr. A. H. Doty, health officer of the port. The department under his superintendence has charge of all ships arriving at the port of New York, inspecting them and their passengers, to determine the state of their bills of health, quarantining passengers from an infected port, if necessary, and in general conserving the safety, not merely of the city and State, but to a great extent of the entire country. The admission of infected matter, whether the source of infection be passengers, clothing or cargo, might spread disease far and wide through the land.

On the shores of Staten Island, near Fort Wadsworth, is the health station of the port. It includes, besides the official residences, an office building recently completed, with laboratory and full disinfecting appliances, a dock and fleet of vessels, the most novel and characteristic of which we describe in the present issue.

This boat, the James W. Wadsworth, represents a complete disinfecting plant, adapted to the treatment of suspected persons, of clothing, bedding, luggage of all descriptions, and of holds of ships. She was arranged to produce a perfect disinfecting boat, the work being done under the superintendence of Mr. E. M. Skinner, of the Department of Health.

Near the stern of the boat and placed amidships is the sterilizing oven. This is a double sided boiler-like structure which is open at its fore and aft ends and which is traversed by an iron cage running on wheels. Its ends are closed, when it is in operation, by doors fastened with lag screws making a hermetical joint. The oven is connected to the steam boiler, so that it can be heated by steam between the walls of the oven, giving dry heat, and if desired, steam can be blown directly into the oven, so as to give wet heat. The oven is used for disinfecting clothing, bedding and baggage of all descriptions. Fore and aft of it are hatchways leading to the upper deck. The material to be treated may be lowered through the after hatch directly into the cage, which is then rolled into the oven. The oven is closed, steam is turned on, and the articles are disinfecting and passed out by the forward hatch, the cage being withdrawn through the forward end of the oven. The cage traversing fore and aft comes directly under one or the other hatch as desired. On either side of the oven are separate rooms fitted



THE NEW YORK STATE HEALTH BOARD'S DISINFECTING STEAMER JAMES W. WADSWORTH.