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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE DEVELOPMENT OF OUR KNOWLEDGE OF THE LAWS OF FLUID MECHANICS[1]

By Professor W. F. DURAND

STANFORD UNIVERSITY

IN the absence of special thought on the subject, we are little likely to realize the dependence of our every-day life on the laws of fluid mechanics. Thus the air as a fluid is drawn into and expelled from our lungs in accordance with these laws. Again the blood circulates through our arteries and veins under control of the same laws. The gentle zephyr which cools our face in summer or the hurricane which leaves death and destruction in its path are only the expressions of air moving under the laws of fluid mechanics. The trajectory of a golf ball or of the shell from a 16 inch coast defense rifle are likewise the expression of the laws governing the relative motion under gravity of a solid body in a fluid. So again the sustentation of the airship or of the airplane or again the need for the expenditure of energy to secure continued movement through the air: these are all expressions in different ways of these same laws. The same is true of the flotation of a ship partially immersed in water and of the need for propulsive machinery and the expenditure of energy in order to insure continued movement.

Again the entire collectivity of the phenomena of lubrication is only a special expression of the laws of fluid mechanics. So likewise are such divergent phenomena as the rapid spread of sugar through a cup of coffee when we use the spoon as a stirrer, and the carriage by the Colorado River of a burden of silt amounting to something like 5 billion cubic feet per year. In fact, the present configuration of the earth's surface, in so far as wind and water erosion

[1] Presidential address at the meeting of the Pacific Division of the American Association for the Advancement of Science, Salt Lake City, June 12, 1933.