stresses on the connecting-rods were always those of compression. With such an arrangement naturally a given cylinder only does half the work that can be obtained from a double-acting cylinder of the same capacity, and this leads to additional weight and space being required for the single-acting engine. For this reason it was the common practice, and still is to a large extent, to run the necessarily quickly rotating dynamo belt-gearing from a large engine making moderate revolutions, and occupying much space; but for a considerable time past the high-speed, single-acting engine, coupled direct, has been a formidable rival. The high-speed double-acting engine has also been growing in favour of late, and, as has been stated, undoubtedly has advantages. The dynamo-electric machine has certainly done one good thing—it has raised the standard of stationary engine design and manufacture enormously, just as the torpedo boat did for marine engineering. The chief features dealt with by Mr. Morcom in his paper were lubrication and vibration, the two great difficulties to be met in quick-turning engines. To effectually lubricate bearings a force-pump is employed, which continuously injects oil at pressure into the space between the shaft or journal and the bearing. The reciprocation of pressure of the shaft on the bearing assists the circulation of the lubricant for the following reason: when strain is above the piston, and the connecting rod is in compression, the journal will be pressing on the bottom brass—we put out of consideration any tendency of the shaft to bend—and, as a journal can never be an absolutely tight fit in its bearing, there will be a space between the top bearing and the shaft. Into this space oil is at once forced by the pressure-pump, and when the stress is reversed the film of oil remains during the whole of the up-stroke, because there is not time to squeeze it out from between the rubbing surfaces before the pressure is again released. The same thing, of course, applies to the bottom brass, and in this way there is always a liquid film of oil between the journal or shaft and the brass or bearing, and the two, therefore, never come in contact. Observed data support the latter view, as the wear on journals has been found to be inappreciable after considerable running; but perhaps the best testimony is that Prof. Kennedy, in an exhaustive test of one of these engines, found the mechanical efficiency of the machine to be 96·3 per cent. It will be seen that in this matter of distributing the oil on the bearing surfaces the double-acting engine has an advantage over the single-acting engine, where the pressure is always in one direction, and is never released while the engine is running, although it may be relaxed. In regard to vibration so much has been done lately, especially by the builders of torpedo craft, that not much is left to add. It may be said that Mr. Morcom is fully alive to the need for providing against the disturbance "due to couples produced by the changing momentum in the several lines of moving parts," and that occasioned by the obliquity of movement of the connecting-rod. He refers to Mr. Yarrow's admirable experiments, and considers the effect of crank angle and multiple cylinders. We have not, however, space to go into these problems, and must refer our readers to the original paper.

A long and interesting discussion followed the reading of the paper.

There were several excursions to neighbouring towns, where works were visited, speeches made, and luncheons eaten after the manner of meetings of this kind. One of the trips which attracted a great deal of interest was that to Coventry, where the much-discussed "motor-mills" where "horseless carriages" are made in such profusion, according to certain glowing accounts, were to be inspected. This establishment is said to be "the largest and best organised for the purpose in the country." To judge by what was seen in regard to work in progress, there need not be much fear that the country will be flooded by horseless carriages for some time to come yet.

A TROUBLESOME AQUATIC PLANT.

FOR several years past an aquatic plant known as the water hyacinth has been developing to such an enormous extent in the St. Johns River, Florida, as to cause serious apprehension in that region regarding its possible obstruction to navigation. About two years ago the War Department was asked to investigate the matter, and did so. In answer to urgent requests for exact information on the subject, the Department of Agriculture, on January 25, directed one of its agents, Mr. Herbert J. Webber, an assistant in the Division of Vegetable Physiology and Pathology, to visit the region and prepare a report covering the following points: (1) Historical notes regarding the plant, including its habitat, manner of growth, propagation, and anatomical and physiological characters; (2) an account of its introduction and spread in Florida; (3) the present distribution of the plant in the State, and its effect on navigation and commerce; and (4) possibilities of exterminating it. Mr. Webber's report has now been issued from the Government Printing Office, Washington, and is very exhaustive. The plant is mostly limited in its growth to sluggish fresh-water streams, lakes, &c., and the character of the water appears to have much to do with its growth. It can endure only a small percentage of salt, and is killed when it floats down into the sea-water. It is normally propagated by seeds and by stolons. Its introduction into the St. Johns River took place about 1890, when a number of plants were thrown into it. They grew there luxuriantly, producing beautiful masses of flowers which rendered the river attractive. At this time no one suspected that the plant would become a nuisance, and it was introduced at various points to beautify the river. In a short time it interfered very materially with navigation, making it, in fact, both difficult and dangerous. Its effect has been most disastrous to those engaged in the lumber trade and in the fishing industry. It is feared that eradication is impracticable, but suggestions are made as to possible methods for keeping the evil in check. Of these the one most in favour with the author is the use of a light-draught stern-wheel steamer, having a double bow or outrigger, which, being forced into a mass of plants, would cause them to gather towards the middle of the boat, where an inclined carrier would pick them up and deposit them in front of rollers driven by machinery, which would force the water from them, thus greatly reducing their bulk. The crushed material could be delivered to barges alongside, to be deposited where no injury could again result, or a cremator could be arranged on a barge alongside of the boat, and so save additional handling.

THEORY AND PRACTICE.[1]

I PROPOSE to speak to-day of the relative importance of theory and of practice in the arts; and especially, of course, in the art of medicine. It is said that Englishmen are falling behind other nations, and especially behind the German nation, in their perception of the value of theory in the practical arts. Now this is somewhat strange and inconceivable to us. Englishmen proudly feel in this year of the Greater Jubilee that their achievements in the conduct of life are not only great but incomparable. Not only has England become great as an empire, as the Roman Empire; it is great also in the achievements of the intellect: the land of Roger Bacon, of Francis Bacon, of Newton and Adams, of Berkeley, Locke and Hume, of Boyle, Priestley, Cavendish and Dalton, of Young and Faraday, of Harvey, Owen, and Darwin, need not be ashamed even before the brilliant nation of Descartes and Laplace, of Lavoisier and Cuvier, of Paré, Bichat, and Bernard. Nor will I forget to speak of our place in letters, wherein we acknowledge none as our masters; for it is of the gifts of imagination no less than of the gift of analysis that scientific theory is born. Can it be true, then, that with these endowments we are to fall behind in the practice of the arts because, as a nation, we have no due sense of the bearing of theory upon practice?

It cannot be doubted, I fear, that, in some departments of knowledge we are falling behind relatively if not absolutely; that we have failed to keep before ourselves a due sense of the value of theory, and have forgotten that, although in generalisation we should never lose our hold upon detail, nor lose our tact in converse with the manifold aspects of life, nor our memory of the devices whereby we must meet the incursions of contingencies often themselves incalculable, we shall nevertheless fall behind in the fight with reluctant nature if we do not incessantly revise our formulas in the light of progressive research on more and more general lines. We have perhaps forgotten that the work of Watt and Stephenson would have made little progress but for the great modern advances in thermodynamics in which, among others, are

[1] Abstract of an address delivered at the combined meeting of the Cambridge and Huntingdon, the East Anglian, and the South Midland Branches of the British Medical Association at Cambridge, by Prof. T. Clifford Allbutt, F.R.S. Abridged from the *British Medical Journal*.