chapter on "Dynamic Pressure of Water," where a jet, acting upon a plate in front of an orifice, is capable of sustaining twice the head, to which the jet itself was due (Fig. 4).

Should the plate be removed the head in both vessels tends to the same value, as was almost exactly demonstrated by Professor Unwin; but does such a condition correspond to our initial problem?

In an experiment of this kind, can we possibly expect any result other than an equilibrium, subject solely to corrections due to frictional and other losses?

Zeuner, if an impartial, conservative authority is to be quoted, in his well-known book on *Practical Hydraulics* (German or French), gives 1.25 as a safe value to be used in $h = \zeta \frac{v^2}{2g}$ while demonstrating that its theoretical value is $\zeta = 2$, he likewise cites a few tests made both by himself, in connection with turbine work, and by others, in experimenting on water scoops, etc., where the value of this coefficient was actually 1.25. Was this because the whole jet was utilized instead of only a small central filament?

Summing up the foregoing, therefore, and without the slightest desire to question the accuracy of the numerous tests, made by well-known experts, the writer does not feel, so far, there is sufficient evidence for the fact that in a single tube $h = \frac{v^2}{2g}$ is the greatest pressure that can be secured; and certain experiments, although made in perfect good faith, rather tend to demonstrate the contrary. So much for the impulse effect.

So far as the suction is concerned, we shall begin by referring to Mr. Ferris' discussion of the same paper by Mr. White. The following are Mr. Ferris' conclusions: (1) The suction effect of the trailing orifice is very little greater than that of the plain static opening, drilled through the pipe wall; and (2) the head, obtained by him was much greater, about 60 per cent., than $\frac{v^2}{2g}$.

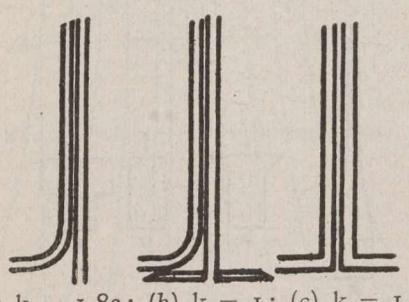
These remarks are very much to the point and we shall now endeavor to generalize them. To begin with, analyzing the suction effect due to the trailing orifice arrangement, one cannot help arriving to the conclusion that, owing to the comparatively low velocities, under which the Pitot tube is operated in practice, there is but little hope to secure any appreciable amount of suction by merely bending back the static tube.

Even in theory it can be proved that there is a certain minimum velocity, beyond which no suction can possibly take place (see Zeuner's book, hereinbefore mentioned).

But there is another point not to be overlooked; the so-called "static" opening, which is sometimes drilled in the pipe or else otherwise finished flush with a horizontal plane, cannot help registering *less* pressure than that corresponding to the "static" head, except, of course, for extremely low velocities. Here water is made to shoot past the opening and it is at this point that some suction effect might reasonably well be expected.

By way of illustration, beside Mr. Ferris' experiment, already mentioned, we might cite a few careful experiments made in Charlottenburg (Fig. 5, taken from Dr. Blasius' article, see *Die Turbine*, January 20, 1910). By k is meant the coefficient in $h = k \frac{v^2}{2g}$. It will be observed from c that the arrangement, which from the standpoint of "trailing" effect should yield the greatest k, actually is much inferior in this connection to the arrangement shown on sketch a, where the static pipe is finished at right angles to the flow.

It is perfectly easy further to intensify the real suction effect. It is well known that, as explained in hydrodynamics, a sudden change in the direction of velocity can cause very abrupt changes of pressure. For instance, in flowing around a sharp corner, even moderate velocities will cause zero pressures or even negative pressures (vacuum, and corresponding interrupted flow). This, then, seems to the writer to be the correct principle on



(a) k = 1.82; (b) k = 1; (c) k = 1.18.

Fig. 5.

which to work to secure the real suction effect, so that the value of c can be reduced to 0.70 and lower (in $v = c\sqrt{2gh}$).

This has been experimentally demonstrated by Mr. Paul Lanham, engineer in charge of pitometer division at Washington, D.C., who had a special rod made according to a sketch suggested by the writer. In fact, the coefficient given by this rod seemed to be a trifle less than 0.70, although this rod was not standardized beyond establishing the above point of giving a very low value of c.

CANADA CEMENT COMPANY'S PLANT AT DAUNTLESS, ALTA.

Building operations are about to commence on the proposed $2,500,000 plant of the Canada Cement Company at Dauntless, Alta. There will be five kilns, each 10 feet in diameter, 240 feet high, and will weigh 600 tons. Including the fire brick lining and an average load of material, the weight will be 720 tons. These are the largest cement kilns in use in Canada and will be second largest in the world. A 10-ton gear, is required to drive each kiln and bearings, weighing 15 tons support the weight; while 16 cars are required to transport each together with bearings and gear. Over 3,000 yards of concrete are required for the five foundations. The cost, including installation, will be $75,000 for each kiln. The plant at Dauntless when completed, will have a capacity of 4,000 barrels daily, and will be one of the largest in Canada.

A bill has been submitted to the General Assembly at Uruguay for the construction of a canal to connect La Picada de Almeida, on the River Santa Lucia, in the department of Canelones, with the bay of Montevideo. This new waterway will be named the Zabala Canal. It will be accessible throughout its course by vessels of 200 tons displacement. The cost is estimated at £3,080,000.

The Pennsylvania Water and Power Co., has let contracts for the installation of an additional unit of 16,000 h.p. at its Holtwood (Pa.) plant. This will make the eighth unit, and will bring the capacity of the plant up to 111,000 h.p., with provision made for the installation of two more units, when required. Along with this improvement a new transmission line is to be erected between the Holtwood plant and Baltimore, which will take care of the increasing business in the latter city. This work will cost about $400,000.