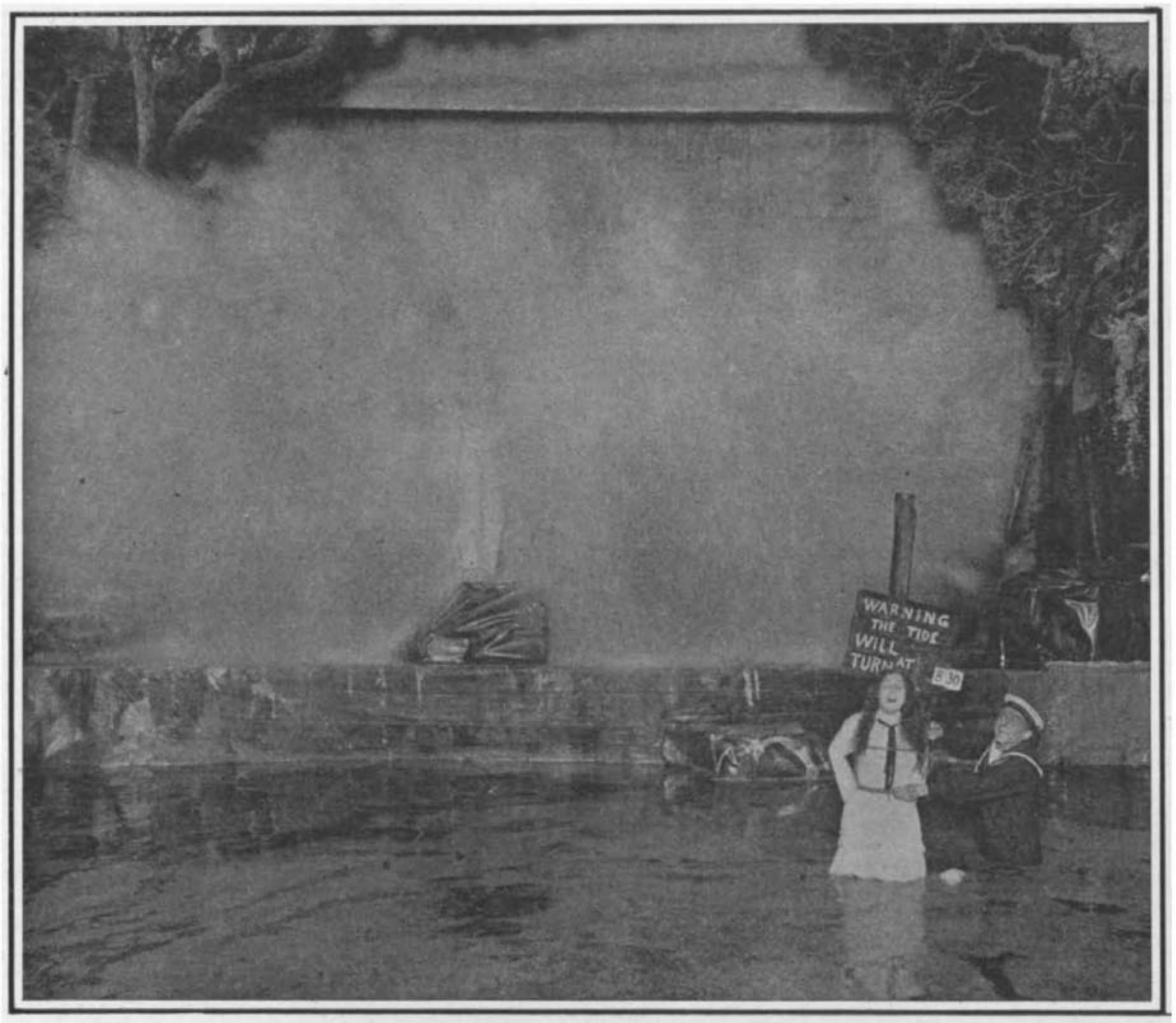
TIDAL-WAVE MAKING ON THE STAGE.

A sensational theatrical spectacle is being produced at the London "Hippodrome" under the title of "The Sands of Dee," of which the pinnacle is the breaking of a series of nine huge tidal waves across the stage. The rollers wash with terrific force, sending the spray some thirty feet into the air with a long muffled roar.



The wave scene as the spectators see it. Photo by Campbell-Gray.

The stage extends forward of the proscenium arch in the form of an arena, the seating accommodation being disposed circularly around this projection. The general setting may be gathered from the accompanying illustration, a typical seaside resort in the height of the season being represented. The stage and arena constitute a stretch of the rock-strewn sands exposed by the receding tide depicted on the backcloth. In the center of the stage is a crude notice warning the visitor of the time when the tide will turn.

In the culminating point of the dramatic storm, the heroine is gagged and bound to the tide-warning board, to be drowned by the rising tide. At the crucial moment the first wave breaks over the scene, catching the escaping villain in its embrace. Eight succeeding waves sweep all before them. The heroine is of course duly rescued by the hero just when the water has reached her shoulders. Her rescuer reaches her on the back of a swimming horse. The whole incident lasts about ninety seconds, in which short interval no less than forty-five tons of water are projected into the arena. No sign of the water is seen by the spectators until the first wave is actually breaking.

The means by which the waves are produced however is very simple, though it involved prolonged experiments for the purpose of evolving what may be termed a perfect wave, which should be as similar to a real ocean breaker as possible. Behind the backcloth up in the flies, seventy-nine feet above the stage, are carried three large rectangular water tanks of special design. They are built of teakwood, strongly bound with iron, heavily lined with lead, to prevent leakage, and supported on steel girders. These tanks are fed from a high-pressure main, the arrangement being such that although the contents of the tank may be discharged solidly, the tank may refill in two or three seconds.

The outlet from the tank has an area approximately one-third of the floor area of the tank. The tank may be emptied just as if its whole bottom were suddenly removed. When closed the mouth of this outlet resembles an inverted apex built upon a lever system, with the result that when outside pressure is applied upon the levers, the closed members forming the apex swing instantly open to their full extremity.

Immediately beneath the outlet from the overhead tanks upon the stage is built what is called a "wave-producing board." This is mounted about one foot above the level of the stage, and is of the most substantial construction, in order to withstand the tremendous vibration arising from the fall of five tons of water at a time from a height of seventy-nine feet. It is of concave form, and extends from side to side of the stage, so as to command the whole of the proscenium opening. The rear face of this receiver or conduit is carried up to a height of ten feet or so, while the front edge is only about one foot above the extreme depth of the concavity. The falling water does not strike the center of the channel, but the inner curved face of the back edge, so that it swirls round the bottom of the channel and up the opposite face unresisted. It shoots into the air across the stage to a height of thirty feet, and falls into the arena a tumbling mass of water.

The backcloth is placed in front of this wave-forming board, so as to conceal the falling water. The lower edge of the backcloth ends a few inches above the upper edge of the rear face of the wave-forming board, and hangs practically in a line with the front edge of the board. The backcloth depicts a sea scene. That part of the inner face of the wave-forming board which would consequently be visible to the audience is embellished with waves executed in waterproof paint, so that the backcloth appears to fall continuously from top to bottom of the stage. When the water, in falling, swirls around the wave-forming board and is impelled on to the stage, it passes beneath the lower edge of the backcloth in a solid sheet. It was in the correct design of this wave-producing board that the greatest difficulty was experienced. The prime object sought after was the projection of a solid roll of water over the stage without any splashing until it breaks in the same manner as an ocean wave. At the same time it was imperative that the course of the water should be to a certain extent directed in its path, so as to save the stage and wings from inundation. As it is, the whole of the water is thrown into the arena.

Scarcely has the first wave broken, when the second rolls out, followed by successive breakers, until the full nine in all have traveled across the arena. About five or six seconds elapse between each wave. When viewed from the center of the auditorium, a very realistic impression of a series of rollers breaking and falling tumultuously over one another is presented. Each wave contains a solid mass of five tons of water, making forty-five tons in all thrown through the proscenium opening at a total cost of over $500 for the water alone. The falling mass, as might naturally be supposed, strikes the wave-forming board with tremendous force, and retains considerable power in its sweep across the stage, rendering the task of the villain, who is caught in its toils, to maintain his footing upon the rocks no easy matter. The crash attending the falling water striking the forming board suffices to produce the muffled roar accompanying rollers breaking upon the seashore.

In order that the stagecloth behind which the water falls may remain absolutely quiescent and steady throughout the whole operation, it is specially weighted to over one and a quarter tons, requiring special mechanism for its operation alone. The water filling the arena is subsequently released and escapes into the public sewers, so that a fresh supply is used in each performance.

Method of Removing Fixed Stoppers.

BY RANDOLPH BOLLING.

Reagent bottles holding caustic alkalies, alkaline carbonates, etc., very frequently become fixed, and the usual method has been to tap the stopper with a wooden block, or the application of heat to the neck, or a combination of both. Results are poor in certain cases and often result in the fracture of the neck. The inverse process may be used to advantage. In other words, freeze the stopper, thus causing a contraction of the stopper from the neck. The bottles which I used for experiment had failed to open, under the heating and tapping, and were bad cases of fixed stoppers. The bottles held sodium carbonate, that had formed sodium silicate, an excellent cement, and so were firmly fixed. They were inverted in a mixture of crushed ice and calcium chloride, taking care that the freezing solution did not touch the lips of the bottles. After standing twenty minutes, each stopper was removed without the slightest exertion. This is the neatest and safest way to remove stoppers from bromine bottles and other corrosive chemicals.

The scene before the "tide turns." Photo by Campbell-Gray.

THE GREAT WAVE SCENE AT THE LONDON HIPPODROME.