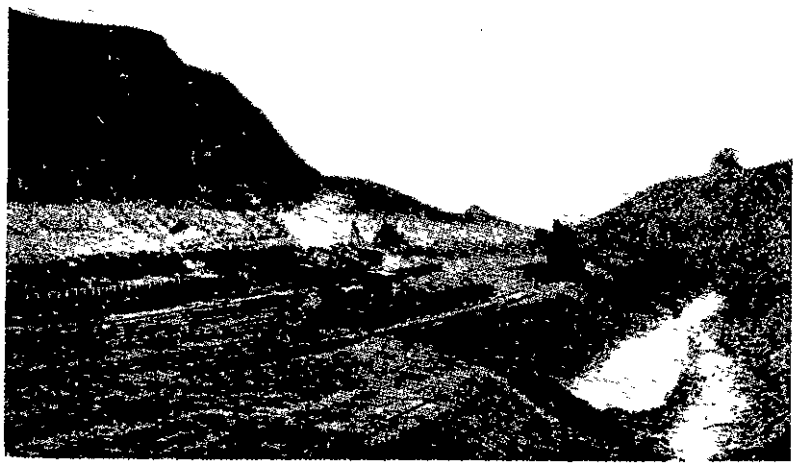
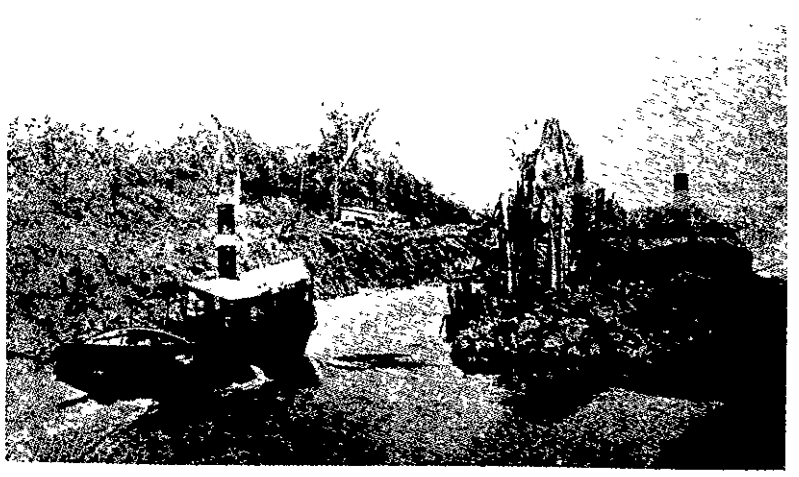


THE DRY PROCESS.



THE WET PROCESS.

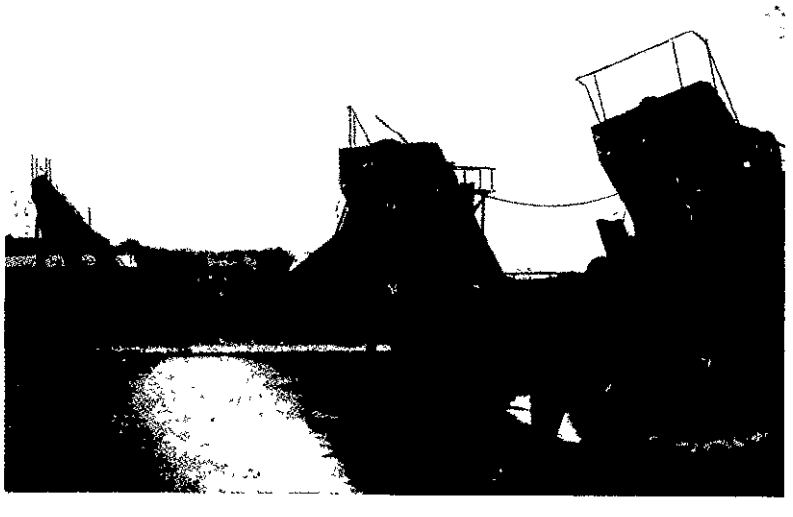
It is a challenge thrown down to the American engineers to justify their position.

No doubt the Americans will reply in good time. For the present it is only possible to consult the report of an American who has lately visited the works and touched upon some of the points made by M. Bunau-Varilla, by a fortunate anticipation. Just about the time that the lecture was being got ready for delivery, Mr. Fullerton Waldo joined a party of eleven members of Congress which had been organized to visit the canal works and judge for themselves of the prospects. Mr. Waldo had an intimate knowledge of all the canal problems. His conclusions appear in the Magazine of Engineering, (February) and are very interesting. He gives a splendid account of the work done, and he details the transformation of a notoriously unhealthy line of country to a degree of sanitation and comfort almost incredible. His accounts of the social life of the Isthmus are most attractive, and he does justice to the extraordinary personality of the officers—Chief Engineer Stevens and the Chief Sanitarian, Colonel Gorgas, of the U.S. Army—to whose credit the whole of the sanitation so successful in those deadly regions is given. But the engineering problem is the subject of Mr. Waldo's briefest and most interesting notes. First he lays stress on the order of the stores department, where everything is obtainable from a quire of foolscap to a pile-driving machine, at a moment's notice. He passes on to detail the paving of the streets of the small towns on the route and to describe their water supplies. Of the rate at which the steam diggers were doing their work he has nothing but praise, qualified by the statement that, when the locomotive power is increased, the rate will be vastly accelerated: adding, that as a matter of fact, locomotives are being hurried to the Isthmus from the best engine yards of the States. That is a plea against the conclusions of the French engineer as to the slow rate of progress with the dry system of excavation.

About the big dam at Gatun he has much to say. First, in the direction that delay was caused at first by the thoroughness with which the ground had been probed for the quality of the earth to be used in construction, with the result that the right quality has been proved to exist in unlimited quantities. Secondly, he shows that the dam is by no means of unprecedented proportions. He says in this connection :—

Standing on the hill above the station at Gatun one gets a very clear idea of the location of the great dam which, next to the excavation of the Culebra cut, is the *crux* of the engineering problem. The little village of Gatun lies at one s feet, at the confluence of the Chagres and the old French canal. It is a cluster of perhaps a hundred little shacks, with a wooden cross-surmounted Catholic church conspicuous in the midst. The dam, more than half a mile through at the base, will completely obliterate the village site. It extends from the hill whereon we stand, across the valley, 7,900 feet, with a single angle, to a corresponding point in plain sight on the hill that forms the opposite wall of the valley. Its cubic contents will be something like 22.000,000 yards. This great dam, with its crest 135 feet above sea-level, and thus 50 feet above the surface of the 85-foot lock level, is not of an unprecedented type. The San Leandro dam, built by the Contra Costa Water Company to supply water to Oakland, California, is an earth dam 120 feet high; and the Pilarcitos dam, 95 feet high, has stood for 40 years; this latter dam was built by the Spring Valley Water Company to supply San Francisco. The north dike of the Wachusett Reservoir in Massachusetts is two miles long, and is planned to have 65 feet of water against it. With a bottom width of 3,100 feet and a top width of about 360, there need be no fear for the stability of the dam."

For the present this is all that can be gleaned from the ordinary sources of public information in answer to the extreme criticisms of the French engineer who has impressed a gathering of engineers with the strength of his views. It is somewhat disquieting to learn that Mr. Stevens, the Chief Engineer who is referred to in Mr. Waldo's report in terms befitting the description of a Napoleon among experts should have resigned since the report appeared. Until an explanation of that resignation—the resignation of the man who has carried out the American plans to their present position—is forthcoming, the resignation will be something like a corroboration, for many people, of the warnings of the French engineer who has thrown down a challenge to the Americans. The world must wait with patience for the reply of the American engineers, who are on their mettle and may be expected to defend their position with spirit. The general public, moreover, will find it hard to understand how a dam can be the damning feature of the American plan because of the liabilities to earthquakes, and at the same time the saving clause in the French proposition. On these matters the reply of the Americans to the Frenchman who has impressed certain engineers to a certain extent, will throw probably considerable light. President Roosevelt is one of the foremost writers of America, and one of the most level-headed men in the United States. He has taken up the Panama Canal project, and we may expect his intervention in the controversy, probably in a full-blown message to Congress.



REMAINS OF FRENCH MACHINES.

CANAL COMMISSION'S STORAGE DEPOT.