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372. IRRIGATION IN  
HAWAII**

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**WALTER MAXWELL**

**BULLETIN NO. 90,  
372. IRRIGATION IN  
HAWAII**



U. S. DEPARTMENT OF AGRICULTURE,  
OFFICE OF EXPERIMENT STATIONS,

A. C. TRUE, Director.

Irrigation Investigations, Elwood Mead, Expert in Charge.

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# IRRIGATION IN HAWAII.

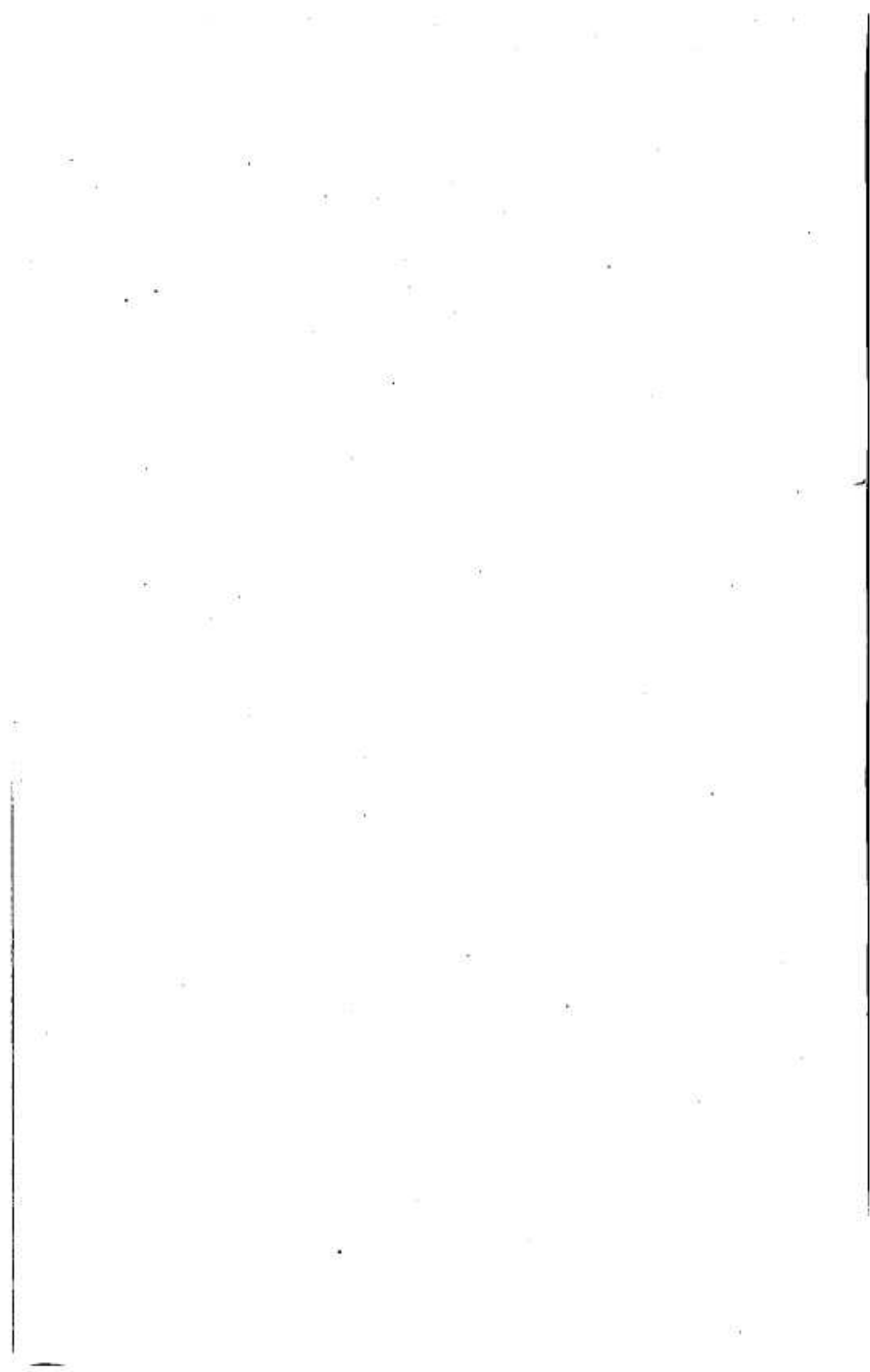
BY

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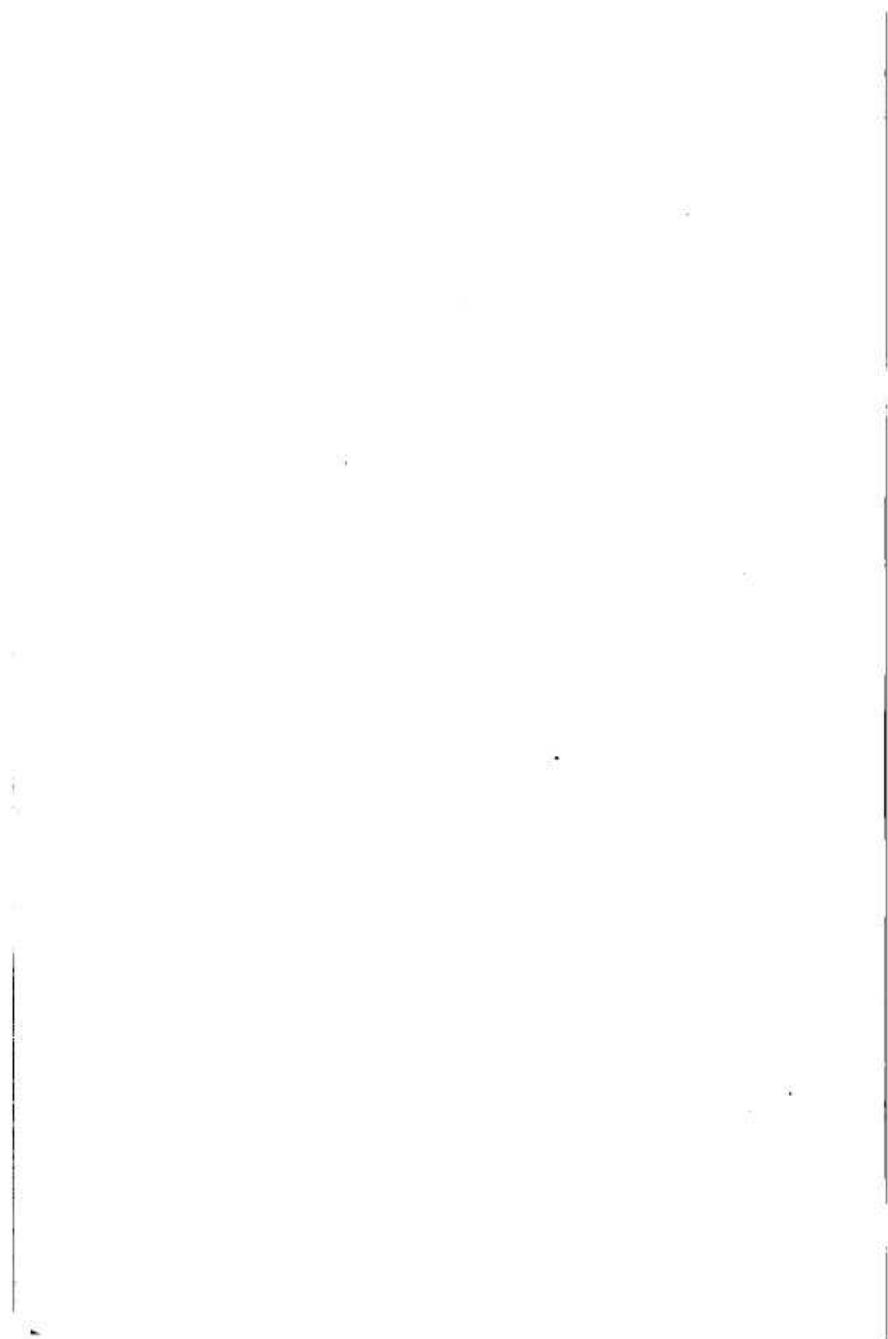
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SIR: I have the honor to submit for publication as Bulletin No. 90 of this Office an article on irrigation in Hawaii, by Walter Maxwell, Ph. D., for a number of years director of the experiment station maintained by the Hawaiian Sugar Planters' Association. This article has been prepared in connection with the irrigation investigations of this Office. It discusses the climatic, soil, and other conditions as affecting irrigation in Hawaii and gives the results of irrigation experiments, especially with sugar cane, carried on by the author for a number of years. It brings out some of the most interesting phases of irrigation problems in that Territory, and will form a basis for further investigations of this subject there.

Respectfully,

A. C. TRUE,  
*Director.*

Hon. JAMES WILSON,  
*Secretary of Agriculture.*





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# IRRIGATION IN HAWAII.

## INTRODUCTION.

The precipitation of atmospheric moisture is very uneven and irregular over the surface of the earth. There are zones that are marked by annual deluges, and there are vast areas upon which rain rarely falls. These rainless areas are not confined to conditions peculiar to specific latitudes, but are found in the tropical regions of India and Africa, over the wide plateaus of North America, and in other localities having widely varying climatic conditions.

The regions of small rainfall are very generally distinguished by lands of great natural fertility. This is due largely, on the one hand, to the absence of great rains that leach out the elements that feed plants, and, on the other hand, to the relative absence of crops, which results from lack of rain. Among the most productive tracts upon the earth to-day are regions that were naturally arid, but which have been rendered productive by irrigation. These tracts include the Punjab and other vast districts of India, the great basin of the Nile in Africa, and large semiarid areas that have more recently been brought under cultivation in the middle and western United States.

The failure of the natural rainfall to produce crops may be due to the insufficiency of the total precipitation, as in regions in India, Africa, and other lands, where it does not aggregate 10 inches per year; or it may be due to the seasonal distribution, as in other parts of India and Africa, in northern Queensland, and some of the Pacific islands, where a heavy and almost the whole precipitation takes place within two or three months. In speaking of the agriculture in parts of the Himalayas, Mr. Buckley<sup>1</sup> says: "Where the rainfall varies from 50 to as many as 100 inches in the year, crops grown on the terraces in the mountains are matured in the dry season by artificial irrigation." In some localities in northern Queensland the annual rainfall reaches and exceeds 100 inches, yet the sugar-cane crop has to linger through an annual arid period which greatly reduces the yield, while upon the Pacific islands of Hawaii, despite the winter rains, many of the most fertile lands would be useless without the prevailing practice of irrigation. Irrigation, consequently, is playing an increasingly important part in modern intensive agriculture.

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<sup>1</sup> *Irrigation Works in India and Egypt*, R. B. Buckley. London, 1893, p. 1.