

## SESSION ON

### PRESENT-DAY PROBLEMS IN RIVER HYDRAULICS

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U. S. Department of the Interior

#### INTRODUCTORY REMARKS

The river hydraulics problems to be discussed here today, although entitled "present-day," have interested and intrigued the writer for the greater part of his lifetime and no doubt will continue to intrigue and interest engineers for many years to come.

The first speaker on the program this morning, Professor E. W. Lane, Associate Director, Iowa Institute of Hydraulic Research, is considered by many engineers as the outstanding authority on problems relating to the transportation and deposition of sediment. He has devoted all of his technical career to problems related to river control. His early work was with the Miami Conservancy District. He was connected with the studies leading up to the Jadwin Flood Control Plan for the Lower Mississippi River. He is familiar with river problems in China and, more recently, has specialized in work dealing with the transportation and deposition of sediment in streams in the Southwest in connection with work of the Bureau of Reclamation and Corps of Engineers. Professor Lane is thus able to draw upon a vast amount of experience as a background for his paper on the subject of bend cut-offs in rivers.

The second and third papers on this general topic relate to the Missouri River. Within the Missouri River Basin are all the problems associated with river hydraulics in their most aggravated form. This fact may have been a compelling one in the minds of Dean Dawson and his associates when they arranged this interesting and instructive program. The Iowa Institute of Hydraulic Research has long been noted for its capacity to assimilate difficult

problems, and this morning's session is in keeping with its high standards.

The Missouri River has been accurately described as one "that goes traveling sideways, that interferes in politics, rearranges geography, and dabbles in real estate." It has all of these characteristics and many more, unfortunately most of them bad. In its strictest sense the Missouri River and its tributaries are an unstable resource embracing all or parts of 10 States and directly or indirectly affecting the welfare and happiness of each of the 8 million inhabitants of the basin. From the days of Lewis and Clark to those of Pick and Sloan, floods and droughts of such magnitude that they have affected our national prosperity and security have taken their toll.

Fortunately, the purpose of this meeting is not a discussion of "by whom and how" this vast unstable resource can be best developed or controlled for the use and convenience of man. The policies concerning these questions have been fixed by the Congress. There may not be complete agreement with the present Congressional policy, but until it is changed it is anticipated that the old-line agencies, working in close coordination and cooperation among themselves and with States and local institutions, will continue their operations under the general framework of a plan approved by the Congress—a plan that embraces all feasible beneficial uses of water, including navigation, irrigation, production of power, domestic water supplies, abatement of stream pollution, silt control, fish and wildlife preservation, and recreation.

The Missouri Basin plan of operation will succeed or fail, depending on two things: first, the degree of cooperation and coordination that can be achieved between the operating bureaus and agencies, and second, the degree to which an over-all plan of development meets the needs of the Nation and of the people of the basin. The success of the plan of development will depend on the degree to which the complicated hydraulic and hydrologic problems of the basin can be solved.

Mr. Riter is especially well qualified to describe the plan and problems in using the Missouri River for irrigation and hydraulic power. Mr. Riter received his technical training at the Utah State College, received the degree of B.S. in Geology in 1926, and B.S. in Engineering in 1928. Practically all of his professional career

has been with the Bureau of Reclamation on problems immediately connected with irrigation and power development throughout western States. Mr. Riter as chief of the Hydrology Division, Branch of Project Planning in the Bureau, is most intimately associated with the plans for irrigation and hydroelectric power development on the Missouri River.

The control of floods on the Missouri River will be discussed by Mr. F. B. Slichter, Head Engineer, Missouri River Division, Corps of Engineers. Mr. Slichter has been with the Corps since 1928 when he joined the organization in the Kansas City District Office. In addition to his technical duties in the Division Office in Omaha, Mr. Slichter is also Secretary of the Missouri Basin Inter-Agency Committee, a committee composed, as you know, of four members representing the Corps of Engineers, the Federal Power Commission, the Department of Agriculture, and the Department of the Interior. In addition, four governors represent the interests of the 10 States in the Missouri Basin.

Mr. Slichter's paper will cover the "Pick Plan" for the control of floods on the Missouri River. This plan, as developed by Brig. Gen. Lewis A. Pick, was approved by the Congress in the Flood Control Act of 1944 as a part of the coordinated plan now generally referred to as the "Pick-Sloan Plan" for the comprehensive development of the Missouri River Basin. The flood control features consist essentially of a system of reservoirs on the Missouri River upstream from Sioux City, Iowa, a system of reservoirs in the tributaries of the lower basin, and a system of levees along the main stem of the Missouri. Mr. Slichter's paper will deal principally with the major floods of record and will indicate the part played by each feature in the Pick Plan of development in controlling floods and alleviating flood damage.