How BOULDER DAM may create a GREAT INLAND SEA

By Ronald L. Ives

DID the engineers who built Boulder Dam inadvertently start a process which will cause the flooding of the fertile Imperial Valley by the waters of the Gulf of California?

Will the Gulf, in future years, extend as far north as Indio, Calif., making that town a seaport?

Perhaps battleships will maneuver over the present site of El Centro, Calif.; and Yuma, Ariz., will be a naval base!

Is this all a dream? A geological Jeremiad? Perhaps, but it has happened twice in the past, and a third occurrence was prevented only by the expenditure of millions of dollars.

Studies of the Gulf of California-Imperial Valley area, summarized by Dr. John P. Buwalda of the California Institute of Technology show that: "The floor of the Salton Basin-Gulf of California trough has been subsiding in recent geologic time and the sea would invade it some 200 miles farther but for the fact that the Colorado river has been building an alluvial cone and delta across it concurrently with the subsidence."

That is, the Gulf of California and Imperial Valley are really one continuous depression in the earth's surface, and the waters of the Gulf would even now be rolling over the submerged valley, but for the fact that the delta of the Colorado forms a great natural dam or levee to hold back the sea.

Back in the dim geologic past, before man came to North America, when the continent was the playground of mammoth and the ground-sloth, the Colorado river began to build a delta into the ancient Gulf of California, and when the ice of the great glaciers carved the Rocky Mountains into their present form, the Imperial Valley was isolated from the Gulf and occupied by a great freshwater lake.

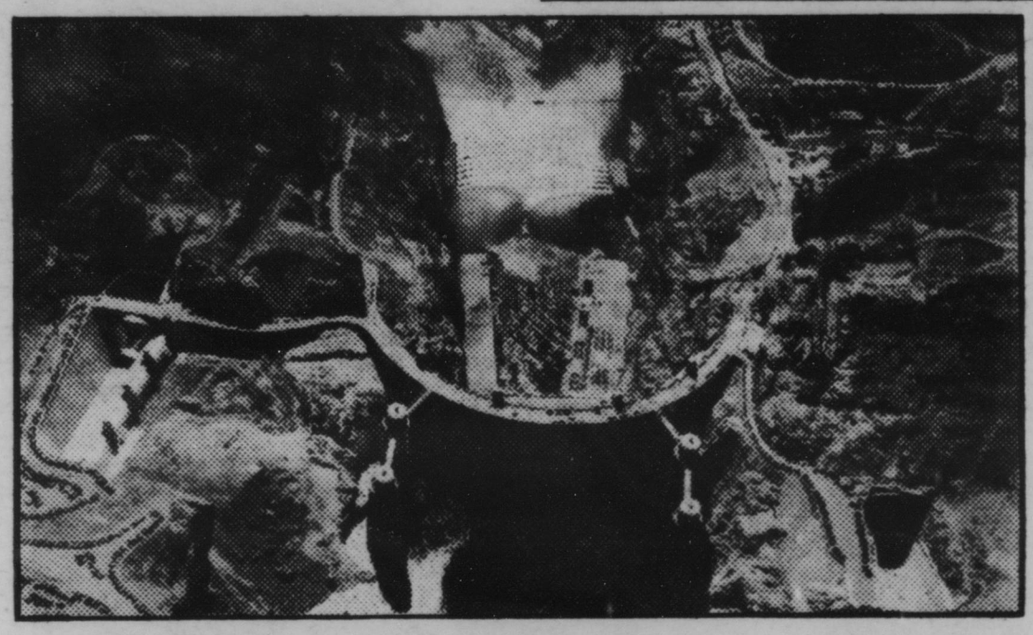
Soon man came to the lake, and lived on the shores, hunting and fishing, and in his spare time carving pictures on the rocks. Then the water of the lake fell, and became salt, and man moved his camps to the bottom of the basin, below sea level.

Floods came down the Colorado, breaking into the Imperial Valley, and driving the early inhabitants out. Minerals deposited by the water covered the ancient pictographs and preserved the story of this great American flood for scientists who came later. Gradually the waters dried up, and the lake level fell, and man reoccupied the valley.

Irrigation made possible a great agricultural center on the shores of America's Dead Sea, and the population of the Salton Sink, now renamed the Imperial Valley, increased year by year.

Again the Colorado river, source of the irrigation water, threatened to destroy the valley, and cut away the headworks of the irrigation canals. The resulting inflow of river water raised the level of the Salton Sea 52 feet in less than two years. In 1907, after a desperate struggle by railroad and irrigation companies, during which whole carloads of broken stone were dumped, cars and all, into the ever-widening channels, the inflow was stopped, and the valley was saved—for a time at least.

"And the fountains of the great deep were broken up." . . . Will Americans of the southwest, some thousands of years hence, re-enact this Deluge scene of thousands of years ago?



Boulder Dam, with its spillways opened. . . . This great reclamation project may create a vast inland sea where the Imperial Valley now lies.

A map of the Boulder Dam area. Should the Colorado river's delta sink enough to allow the waters of the Gulf of California to invade Imperial Valley, a great inland sea would be created.

Frequent minor earthquakes warn that the sinking of the trough in which the valley lies has not stopped. The alluvial land built by the Colorado river is still an effective dam, keeping the waters of the Gulf of California out of the Imperial Valley, but the danger of floods in the valley is ever-present. Only one long crack is needed to let the waters in. Fortunately, alluvial soil seldom breaks into cracks 50 miles long, no matter how violent the quake.

TODAY, the Colorado river is not building any more delta. Boulder Dam and the other smaller dams on the Colorado are holding back the sediments. The great natural dike separating the Imperial Valley from the Gulf of California is no longer being built up. In fact, the now clear water of the river will probably cut into its former deposit, and carry away portions of the great dike. In addition, the waters of the Gulf are forever cutting away at the south end of the dike, removing material and invading the land.

Will the trough continue sinking until the dike is too low to hold back the waters of the Gulf? Geologists would like to know that, too. According to the theory of natural balances (called Isostasy by geologists) the land will sink only as material is piled on it. If this theory holds true, and if it can be applied to the Imperial Valley area, the sinking will not continue. If, however, the sinking is caused by other factors (and these other factors are many and complex) then, despite all efforts of man, the sea eventually will invade the Imperial Valley, creating a great inland sea nearly 200 miles long and 50 wide.

What will this day in the far-distant future be like? Great masses of water will plunge into the valley, which lies more than 200 feet below sea level today, and which will have to sink at least 50 feet more before the cataclysm can occur.

There will be warnings, perhaps. Men will flee by highway and railroad, by plane, perhaps afoot. Earthquakes may accompany the deluge as new strains are set up in the earth's crust by the shifting of great masses of water. Great waves will rush across the growing lake, crushing all before them, and destroying the boats of those men of the far future who might attempt to emulate Noah. A week may be necessary for the final filling of the basin—perhaps it will require two weeks.

Then, under the blazing sun of the California desert, a new sea, dotted with wreckage and the bodies of those who fled too late, will shimmer and ripple in the vagrant breeze. After a million years the sea will have reclaimed its own. The Imperial Valley will then be the Imperial Sea.

FLOODS similar to the one that may take place in the distant future in the Imperial Valley have not been unknown in the geologic past, and may have occurred in the ancestral home of mankind some thousands, or tens of thousands, of years ago. Many nations, on several continents, have legends of floods almost identical in all their major features with the Noachian Deluge.

Among the Papago Indians of the American southwest, whose tribal range is not far from the site of this possible future flood, there is a very complete legend of a tribal hero-god, named Iitoi, who knew that there was going to be a flood, and made a boat, using locally available materials, in which he saved himself, the coyote, and the beetle. After a tempestuous journey, during which he floated four times around the world, his craft stranded on a mountain-top in Sonora, and he emerged "very thin after his long journey." With the aid of the beetle and the coyote dry earth was excavated from under the mud, and new lands were built.

Perhaps the Noachian Deluge is an account of an actual flood, transmitted from generation to generation and tribe to tribe by word of mouth. Perhaps this flood was the result of the inundation of the Mediterranean Basin by the waters set free by the melting of the glacial ice.