

that can be trusted implicitly; and there are others—Latter-day Saints, too—that people are chary about trusting. This should not be. Our word should be just as good as our note. But we should not be in a position to have to give notes, if it is possible to avoid it. It is true, there are industries and enterprises to be established for the benefit of the people in which it seems to be necessary to borrow, as, for instance, the sugar factory. I do not believe that there was one man connected with the inauguration of that industry that went into it with a view of making himself rich. It was done to benefit the people and the country. I know this to be the case; and if we, as a people, had risen up in our strength and with one common consent had said, "Yes, we will sustain this home industry and give our means to support it," and had taken up the stock of this institution, we would in a little while be glad of it. This thing will be a success by and by. We need not look for new industries like that to strike right into affluence at once and be able to pay dividends the first, second or third year. But we look for it to benefit the people. I believe it is benefiting the people in the neighborhood where the factory is located. There are other industries that may be inaugurated that will also benefit the people. This has been the counsel all the day long. In cases of this kind perhaps it is wise to lend our credit to get money, that the enterprise may be established. But as a rule, in private affairs, I do not believe it is a good thing to borrow. I think we ought to live within our means; and if we earn fifty cents a day, try and live on forty-five cents a day, so as to have something laid up for a "rainy day."

This subject is one that could be talked about a great deal. The Latter-day Saints understand these things pretty well, because President Young and President Kimball used to talk about them. I recollect hearing President Kimball in the fall of 1853. He was talking about cultivating a city lot down here in the nineteenth ward, I think. He said he had realized \$1,000 in cash off one city lot that year. Now, there could be thousands of tons of food for man and beast produced right here in this city, where today there is nothing grown. If you do not believe what I say, get into a carriage and ride over this city, and you will find it to be the case. God bless you. Amen.

LAKE BONNEVILLE.

The following is a lecture delivered by Prof. Marcus E. Jones before the last meeting of the Salt Lake City school teachers:

This is the name given by Mr. G. K. Gilbert to the lake which formerly occupied the greater portion of the inhabited part of Utah, who dedicated it to Captain Bonneville, one of the early explorers, under the erroneous impression that to him belonged the credit of the discovery of the lake. The name should, however, have been given to some of the earlier discoverers or explorers. Captain Bridger, so far as history goes, was the first white man who ever saw the lake, and to him certainly belongs the credit, rather than to Captain Bonneville.

In order to understand the history of this lake, we must first know something

of its previous geology. It is generally accepted by geologists that an ocean covered the whole of North America before the beginning of that part of geological history, as we now know it outside of that of the eruptive rocks. There may have been small portions of the primordial rocks which rose above this ocean in northeastern North America, and possibly very small islands, even in Utah; but that was all. It is evident that whenever water covers a surface and by its waves and currents washes broken rocks, sand and dirt from the uneven surfaces of its bed, that these matters will be carried into other places near or remote, and be laid down horizontally to form the new bed of the ocean. This process will continue as long as there is any water covering that portion of the earth. The continual deposition of sediments from the water of the ocean has been almost the sole cause of the stratified rocks as we now see them. This accumulation has gone on for probably millions of years, and the thickness of these rocks is measured by miles. The first rocks which were thus laid down in the history of the world were necessarily sandstones and the like, because at that time there were none of the finer sediments produced by organic remains which afterwards went to form the great body of rocks which we call limestones. These earlier sandstones have been given the name of Archæan, and for our purposes we will attempt to make no fine distinctions, but simply take the rocks and their names as they are commonly understood among unscientific people.

The Archæan sediments very quickly became sandstones, and being the earliest rocks have been covered so thickly and so deeply with subsequent deposits and have been subjected to so many tremendous changes due to the upheaval of mountain chains, that these rocks have been either melted or changed into quartzites, slates or schists.

Following the Archæan came the Silurian, which for the most part is characterized by immense bodies of limestones filled with animal remains, these animals being chiefly shells called bivalves.

Following the Silurian came the Devonian, or the Age of Fishes, which were also limestones chiefly, and contained the remains both of shells and fishes, and even of some reptiles.

Following the Devonian came the Carboniferous, a name which has been applied to these rocks because of the immense beds of coal which exist in the eastern states.

During the whole period represented by these various ages, all but a very small portion of Utah was far beneath the surface of the ocean; so far below that few, if any, sandstones were deposited, and the rocks were almost entirely compact limestones. The only portion of Utah which was not so deeply buried is represented by the Uintah mountains, which contain immense beds of carboniferous sandstones.

The question may be asked, why we separate the history of the earth into these different ages. The answer is that where the history of the earth has been uniform as shown by the undisturbed condition of the rocks and by the uniformity of the life in them (represented by the animal remains) geologists have

been accustomed to make no distinctions and to call it all one age; but wherever there has been a break in the deposits or in the life represented in them, in which tremendous changes have suddenly occurred or appeared, these changes being caused by catastrophes, as we term it in geology, or, in other words, by tremendous upheavals of mountain chains or great elevations of the surface of the land, geologists have seen fit to consider that these breaks represent the beginning of a new form of life or a new geologic history, and so at the time of each one of these great geological breaks they have made the beginning or the end of a geological age. Thus at the end of the Archæan we find tremendous breaks in the history of the earth, and also at the end of the Silurian, the Devonian and the Carboniferous. It is true that other breaks have occurred within these various ages, and they have been given other names and geologists differ as to the number of breaks which have occurred which are worthy of being used as separating points between the ages, but for our purposes we need consider only the ages which I have mentioned.

The history of Utah practically begins, then, with the end of the Carboniferous age, in which a tremendous plateau was raised above the surface of the ocean to the height, according to King, of 40,000 feet above the sea. This assumption, however, is undoubtedly erroneous and it is not possible that the plateau was ever more than a small fraction of that distance above the sea, as the plateau was greatly eroded or worn away by the action of the elements, and because the Wasatch mountains which are the basis of King's calculation, have been gradually rising in all probability from the beginning of their upheaval to the present time, and have been as gradually eroded by the elements. This great plateau extended for several hundred miles, beginning with what is the Wasatch mountains on the east and extending nearly to the present Sierras on the west, northern Arizona on the south and Idaho and Oregon on the north. Our reasons for believing that the upheaval occurred at that time is that none of the later sedimentary rocks have been ever found west of the Wasatch or east of a point some distance east of the Sierras, except some deposits which are evidently due to the existence of lakes within the region.

After this plateau was upheaved the ocean still washed the shores on all sides and continued to deposit its sediments upon its bed. The sediments near the shore of the great plateau would necessarily be sandstones, and such we find to be the case. The sandstones were of great thickness and have been found to follow the border of this great plateau throughout its entire circumference. The age represented by these sandstones is called by geologists the Triassic, and even throughout the world is largely represented by sandstones. Following the Triassic came an age of comparative quiet and rest, in which limestones were deposited. This is called the Jurassic, and is represented in Utah by very thin bodies of impure limestones overlying the red sandstone rocks of the Triassic. These, as well as the Triassic, are found everywhere on the eastern slope of the Wasatch mountains, and are especially well