

years since the more advanced creamery owners began to practise this method, and the results have been so uniformly satisfactory that it is adopted in all creameries, when the ordinary methods fail to bring out the desired quality. The creamery owners were not slow to take advantage of this new discovery when they found that it afforded the butter-maker genuine and valuable practical aid. The honor of introducing this important improvement in dairy processes does not belong to any one man. Several scientists isolated and successfully prepared cultures for use independently of each other; though doubtless Professor V. Storch of the Experimental Laboratory, Copenhagen, deserves the lion's share of the credit. He has investigated the subject for some years, and published several important papers on the results of his researches. There are now three or four laboratories from which the prepared cultures are offered for sale to the dairies. They keep their processes secret, each following its own methods, the result of which is that their cultures differ, both in kinds of bacteria and method of treatment. This has brought out the fact that the beneficial species, as indeed also the injurious ones, are quite numerous, and that certain forms coöperate in the production of aroma and flavor, but that it is by no means necessary that a large variety should be present. Thus Mr. E. A. Quist of Skanderborg, Denmark, a young bacteriologist who has become deservedly famous for his successful work in this line, uses but two forms, which singly are ineffective, but together produce a very superior quality of butter.

The "secrets" in this work are, of course, far from impenetrable. They are confined chiefly to the composition of the nutritive fluid in which each laboratory has found it most expedient to propagate the bacteria employed, and this can, of course, be ascertained by experiment.

The value of "pure cultures" has been proven by practical experience. It remains to acquaint our dairy workers with the facts, and for our bacteriologists to take the work in hand. It offers a wide field for fruitful investigation.

INDIAN PAINTINGS IN SOUTHERN CALIFORNIA.

BY DAVID P. BARROWS, POMONA COLLEGE, CLAREMONT, CAL.

The Indian tribes which sixty years ago filled every valley of California have now either entirely disappeared or are represented by mere handfuls of descendants. These tribes left quantities of implements of their daily life to attest their vast numbers and certain remains through which can be traced their beliefs and customs.

An interesting study are their "picture rocks." These are found in many places throughout the coast and some of them have been examined and described.

In several localities in Southern California there are painted rocks to which, we believe, attention has not been called.

In the Perris valley, among the stony hills west of the town, are three rocks from twelve to twenty feet high which are covered, each on one side, with Indian paintings. There is evidence that this hillside at one time was the camping ground of a large number of Indians. About each spring the flat boulders are filled with holes in which acorns and seeds were pounded, and pestles and *metates* are numerous. Bits of pottery, a portion of a grass basket and a few arrow points have also been found here. Twenty-five miles away on the opposite side of the San Jacinto plains there is now the small village Saboba, of the Serano Indians.

On the Radec Creek thirty miles east of Temecula is an interesting case of rock painting. A hundred feet above the stream on the hillside there is a small cave formed by huge boulders piled together. It is evident that the front of this cave was once walled up with brush, stones and earth and that it was used for a *temescal* or sweat house. The cold stream is at hand into which the patients, dripping with perspiration could plunge. The inside of this cave is painted with the same designs and colors as the Perris rocks. A flat rock inside is filled with holes in which it appears that the minerals for making the paints were ground. Digging down a few inches, into the loose soil of the floor, brought up broken pottery, charcoal and ashes, and bits of small bones.

The interior of the cave is blackened with the smoke of the fires.

This cave is a quarter of a mile from the site of an abandoned village, which the Indians say was called Sequala. Relics, including a number of arrow points more perfect than are usually obtained in Southern California are here found. In the Strawberry valley in the San Jacinto Mountains there are four more of these painted rocks. The Cahvilla Indians still visit this valley for acorns and piñones.

Doubtless search and inquiry will reveal much more similar work. The designs, which in all cases are much the same, consist mainly of wavy and angular lines, diamonds, and geometrical patterns and figures formed by dots. The print of the open hand is occasionally seen.

There is little remarkable in these paintings unless it be the absence of *pictures*, and the fact that the same designs were adhered to not only by different tribes but by tribes of different stocks, showing that the established forms were wide spread and rigidly followed.

The colors used are red, black and white. They are made from mineral earths found in the mountains around, which are ground, mixed to the consistency of paste, and applied.

The most striking fact in regard to these paintings is this: Among the Cahvilla Indians whose home is in the San Jacinto Mountains, twenty miles from Radec Creek and eighteen from Strawberry valley in the opposite direction, there are two old men, and now only two, who at some feasts perform a remarkable war dance. The dancer is stripped to his breech clout and then girt with a kilt of beautiful brown eagle feathers, and his head is covered with a feathered war bonnet. His face and body are then painted with the same designs and colors which we have noticed. The same mud paints are used and sometimes the hand is daubed and its print struck upon the dancer's broad shoulders, precisely as it appears upon the Perris Rocks. Thus dressed and painted the old warrior proceeds to execute a dance which we venture to say is one of the most wonderful among the strange dances of the North American Indians; a dance which makes the old women shout and cry in excited remembrance, and infirm old braves wave their arms and join in the wild song.

There must be significance in these designs so carefully followed and preserved.

The writer and others are arranging for fuller examination of the rock paintings of Southern California with a view to publication. This note is intended simply to call attention to the double use of these designs upon the rocks and in the dance body-painting.

NOTES AND NEWS.

THE sixth annual meeting of the American Economic Association will be held in Chicago, September 11-15, 1893, in one of the assembly halls of the University of Chicago. It is expected that the general headquarters of the association will be at the university, which has not only permitted the use of one of its halls for the assembly to meet in, but also offers rooms in its dormitories at a moderate rent by the day or week to persons attending such conventions. Two meetings of the council of the association will be held during the session, and the programme as announced includes, besides the annual address by the President, Professor Charles F. Dunbar, the following papers: The Value of Money, by Francis A. Walker; The Relation between Interest and Profits, by Arthur T. Hadley; The Scope of Political Economy, by Simon N. Patten; The Genesis of Capital, by J. B. Clark; The Wages Fund at the Hands of the German Economists, by F. W. Taussig, and Marshall's Theory of Quasi-Rent, by E. R. A. Seligman. Several other societies dealing more or less with economic questions, including the International Statistical Institute, the American Statistical Society, the Social Science Congress and the Labor Congress, are to meet at Chicago at about the same time as the American Economic Association, and, as arrangements have been made to have the scientific sessions of these various societies held at different times, a rare opportunity is presented for the students of economic and social subjects to meet their co-laborers of this and other lands.