

SCIENCE

FRIDAY, MARCH 23, 1888.

COL. CARROLL D. WRIGHT, chief of the Bureau of Labor Statistics, is now engaged in the preparation for the work of the coming year. The subject he proposes to have investigated is the actual earnings of the railroad employees of the country. To ascertain this, he does not propose to be content with averages, but will ascertain from the pay-rolls of the companies just what each man in each grade of employment receives during the year. From this he will be able to determine what the actual earnings in the several departments are. The defect of all statistics of this kind, except those gathered by Colonel Wright in Massachusetts, is that they have dealt chiefly with averages, which really give no idea whatever of what the income of the working-people is. Dividing the total amount of wages paid in a month, or a year, by the total number of employees, produces a result that is of little or no value in economics. As the proportion of high or low priced employees is increased or diminished, the average will be raised or lowered, though the actual earnings of an individual in any particular department may not be changed. The series of reports now issuing from Colonel Wright's office are of more scientific value than any statistics heretofore published by the government, excepting the census reports. They are collected in accordance with a carefully devised and skilfully worked-out plan prepared by Colonel Wright himself. The agents employed are experienced and trained, and the results are calculated to show the actual facts. In the discussion of these facts, Colonel Wright has no preconceived theories to establish, no partisan purpose to serve. The one object is to find the truth, and, that discovered, the purpose of Colonel Wright's work is accomplished.

THE UNITED STATES DEPARTMENT OF AGRICULTURE has issued the third part of the report on foods and food adulterants. It treats of fermented alcoholic beverages, malt liquors, wine, and cider, and represents a vast amount of work by C. A. Crampton, the chemist, and his assistants. The opening sentences of this report are calculated to excite a good deal of thought and reflection. They are as follows: "The production of malt liquors in this country as an industry is second only in importance to the production of breadstuffs. Their consumption is steadily on the increase, as is also the amount consumed in proportion to other kinds of alcoholic beverages." These facts are well illustrated by tables, from which a few figures will be selected. In 1840 there were consumed in the United States, 23,310,843 gallons of malt liquors. From that time until 1886 the amount of annual consumption increased, until during that year it had reached 642,967,720 gallons. In 1840 the consumption *per capita* of the population was 1.36 gallons, while in 1886 it was 11.18 gallons. During the same period the *per capita* consumption of distilled spirits has decreased from 2.52 to 1.24, or, in other words, the malt liquors have been driving out the distilled at the rate of about .05 of a gallon *per capita* each year, and supplanting them at the rate of about .38 of a gallon *per capita*. It is estimated that the amount expended for beer per annum is \$304,852,683, placing the cost to the consumer at 50 cents a gallon. The annual cost to the consumer, of all liquors consumed, is placed at \$700,000,000. And yet the statement is made that the United States, although holding her own in the quantity of distilled liquors consumed, is still far behind the other great nations in the consumption of the milder alcoholic

liquors; and the statistics certainly bear out this statement. Thus in the United States there were consumed 11.18 gallons of malt liquors *per capita* in 1886: in the United Kingdom there were consumed 32.79; and in Germany, 23.78 gallons in the same period. In speaking of the enormous consumption of beer in the United States, Mr. Crampton says that there is no beverage that compares with it in the amount consumed by the people, except water, and possibly milk; and that but little supervision has been exercised over its manufacture and sale, except the rigorous enforcement by the government of its demands for a share in the profits. The processes of brewing, malting, fermenting, clarifying, and preserving are fully described in the report, and analyses are given of all the beers which are drunk in the United States. From these it would appear that the average amount of alcohol, by weight, is 4.63 per cent. Of thirty-two samples analyzed by the department, salicylic acid was found in seven. These were all bottled beers, one of them being imported. None was found in any of the draught beers. Of the nineteen samples of American bottled beers analyzed, six contained this acid. These six included the product of some of the largest breweries in the country,—beers that are used to a very large extent all over the United States. Whether the acid is added in the breweries where the beer is made, or by the local bottlers, could not be determined. The acid is added to prevent fermentation, and as has been shown by Dr. Bartley, formerly chief chemist to the Brooklyn Board of Health, the amount which beers contain is sufficient to be injurious to health. Of seventy samples of wine examined by Mr. Crampton, including champagne, burgundy, claret, sherry, sauterne, and other wines in common use, eighteen contained salicylic acid, and thirteen sulphurous acid, which had been added as such or in the form of a sulphite. One sample in forty contained one aniline dye-stuff, probably fuchsine: this was a California claret. In the analyses which were made of cider, some were found to contain as much as 8.09 per cent of alcohol by weight, the average being 5.17 per cent. These were all well-fermented ciders, and all bottled but one. In the 'sweet' or incompletely fermented ciders, the percentage of alcohol averaged 1.40, the lowest being 0.20, and the highest 3.46. No salicylic acid was detected in any of the ciders examined, and but one was adulterated. This was a bottled 'sparkling cider,' handsomely put up in neatly capped bottles, and of a clear, bright color. In it were found both bicarbonate of soda and a sulphite. This report is in its entirety a most valuable one, replete with information which is interesting to the general reader, as well as instructive to the scientist.

THE STATE BOARD OF HEALTH of Illinois has been the pioneer in the movement to restrict the practice of medicine to those who are qualified. This policy has been based on a law passed by the Legislature of that State, giving to the board the sole power to grant licenses to physicians, without which the practice of medicine is illegal, and the offenders subject to a severe penalty. The law grants to the board the additional power of revoking licenses which have previously granted. It has been hitherto supposed that there was no restriction on this power of revocation, but a recent decision of the courts in that State would seem to indicate that this power cannot be exercised without limitations. An Illinois physician having advertised in the newspapers, the State board revoked his license. The court maintains that the right to advertise one's business is a right to which every citizen is entitled, and that to deprive him of this right is unconstitutional, and that members of

the medical profession cannot be discriminated against, any more than the members of any other profession or trade. This decision will, we presume, be appealed from, and the final result will be watched with interest.

WASHINGTON SCIENTIFIC NEWS.

Zuñi Mythology and Religion: a Valuable Contribution to Anthropology. — The Life-History of *Tænia Pectinata*: Does the Presence of this Parasite explain the Winter-Killing of Sheep? — The Function of the Bone in Anchoring Implanted Teeth: Result of Dr. W. M. Gray's Investigations. — Some Recent Discussions of Target-Shooting. — Obscure and Conflicting Phenomena of the Drift North of Lake Ontario. — Sources of Error in the Determination of Atomic Weights. — The Pristine Homes of the Indian Tribes of this Continent.

Zuñi Religion.

THE annual meeting of The Women's Anthropological Society, held March 8, was a memorable one in the history of that organization. The paper of the evening was read by Mrs. T. E. Stevenson, the president of the society, on the Zuñi religion; and the most accomplished anthropologists in Washington, who were present as guests, pronounced it, in the conversational discussion which followed, to be the best presentation of a savage religion yet written.

Introducing her subject, Mrs. Stevenson said, that, according to Zuñi tradition, all Indians entered this world in the far North-west, having ascended through three lower worlds before their advent here. "The Zuñi came to this world by the command of the Sun," she said, "who sent his sons, Ah-ai-u-ta and Ma-a-se-we (two little war-gods) as bearers of his message, and to guide them to his presence. They ascended from the lower world through a huge reed. Po-shai-yan-tka, the high priest of the Zuñi, followed immediately after the gods. The other priests came next in succession; then the eight original medicine orders and all carnivorous animals. Upon reaching this world, the Zuñi for the first time beheld the light of day, and they bowed to the earth, and hid their faces in fear. It was discovered by the light of day that the Zuñi possessed long, hairless tails, which Ah-ai-u-ta amputated with his stone knife. According to the word of the present priest of the warriors, the people also had long ears, reaching to the ground, which they rolled and tied up by day, while at night they served as a bed and covering.

"The Zuñi do not believe they existed in interior worlds as animal species, other than Zuñi themselves, with their great ears and hairless tails. The other animals could communicate with them as between man and man. These animals were superior to the Zuñi, and were then, as now, mediators between them and the gods. They held all medicine secrets, which they revealed to the Zuñi only after coming to this world."

Mrs. Stevenson then enumerated the medicine orders in the succession in which they reached this world. "These orders," she said, "also the priests of the cardinal points and others, brought many precious articles from the lower world, which they carried on their backs in sacred blankets, the E-to-ne being the most valued fetish they brought. The E-to-ne is a miniature sarcophagus, in which two frogs and two tadpoles, the first offspring of the frog, seeds of cotton, and other vegetation, are incased. On the top of this stone case are eight te-lik-yi-na-we, or plume-sticks, laid lengthwise, about an inch of each one projecting over the edge of the box. Between the eight plume-sticks is an ear of corn representing the mother-corn, or fecundity. The case is wrapped with a piece of ancient cotton cloth, and around the whole are strings of turquoise and ko-ha-qua beads. In some instances the E-to-na is so heavily wrapped with beads that nothing else is to be seen except the projecting ends of the plume-sticks. On the end of each stick a breast-feather of the eagle is attached, pendent, by a cotton cord of native manufacture. The Order of Rain has, in place of the E-to-na, a female stone image, eight inches high, — the Wi-ha-tsan-na Ah-win-tsi-ta, the great mother of all infants.

"The Order of the Ha-lo-o-que has, instead of the E-to-na, a stone knife, the destroyer of all enemies. This knife is about twelve inches in length."

After enumerating the other medicine orders, Mrs. Stevenson gave in very brief outline the story in connection with the forming of the Order of the Hunters, as follows: —

"A strange people were discovered by certain ancestral gods. Three of the gods were captured, and a battle was the result. The lines of the enemy were protected by the tCha-que-na, the keeper of all game: she passes to and fro, shaking a rattle. Great efforts were made to kill the woman, and, though many arrows pierced her breast, she still continued to walk, and shake the rattle. The war-god, Ah-ai-u-ta, finally declared she was carrying her heart in the rattle: he aimed his arrow at the rattle, struck it, and the tCha-que-na fell dead. It was now an easy matter to rout the enemy and enter their home, which they did, opening the wall that enclosed all game, permitting it to go where it would, and thus the game spread over the earth."

The stories of the origin of the other orders were also given briefly, and then Mrs. Stevenson continued the Zuñi account of their establishment in their present home, as follows: —

"Po-shai-yan-tka did not remain long with his people after reaching this world: he travelled with them for a time southward, then, separating from the main party, he, accompanied by the orders of the Ne-we-e-que and Shu-ma-a-que, his wife, I-ya-ti-ku (who was very beautiful and good), and all the animals that came to this world with him, travelled far to the east, then south. A long time was consumed in his journeying, and he built many villages on the way, and, finally reaching the Rio Grande, built houses in the cliffs. These the Zuñi locate as the line of Cavate houses west of the pueblos of San Juan and Santa Clara, in New Mexico. They extended some thirty miles along the right bank of the Rio Grande. These ruins are known to the Zuñi as the singing house of Po-shai-yan-tka; for it was here the animals gave to Po-shai-yan-tka their songs and medicine secrets, he in turn instructing the people. Po-shai-yan-tka, before separating from his people, gave to them the priest Yan-a-o-loo-a to be to them a father in his absence, he promising to return to them, wherever they might be. Old Zuñi priests say they are weary with watching for his return. The name of this departed priest is so reverently held by these people, that it is seldom mentioned excepting in prayer, and each day prayers of supplication are made for his return. This priest is believed by the Zuñi to be the Montezuma known in Mexican history.

"The Zuñi, led by the war-gods, travelled many years to the south, then east, stopping often to build villages, where they for a time lived. Besides the thirteen medicine orders of Zuñi, there is an order to which I referred in a paper previously presented before this society, — the Order of the Kok-ko, the mythological period. It will be remembered that I mentioned in that paper the transformation of a boy and girl upon a mountain-top, who had been sent in advance to look for a place on which to build a village. After the transformation, the youth descended to the plains below, swept his foot through the sands, and created a river and a lake, and in the lake a group of houses, the centre one being the great assembly-house for the Kok-ko. The first three gentes to cross this river were the Sand-hill Crane, Bear, and Corn. The women were afraid, and dropped their children into the water; and the little ones were transformed into ducks, snakes, lizards, etc., and afterwards changed into the Kok-ko, becoming ancestral gods. The three gentes who lost their children composed the Order of Wood, and this order, after becoming childless, determined to leave their party, and go in search of their beloved priest Po-shai-yan-tka. From this point the Zuñi advanced eastward some sixty miles, locating upon the present site of Zuñi. The present village, however, was built upon the old village after their return from a mesa near by, upon which they lived for a long period, and where extensive ruins are now to be seen.

"The Wood Order, after separating from the Zuñi, took first a northerly course, then easterly, reaching the Rio Grande, and passing down this river till they at last found the home of the much-longed-for father. During this journey they built four villages about equal distance from one another, remaining at each village four years, which words, however, according to Zuñi tradition, refer to periods of time. This order found the home of their father, Po-shai-yan-tka, guarded by formidable sentinels. The first was a mountain-lion decorated with two eagle-plumes, — one attached to