

#### Analyses of Egyptian Gold.

M. Berthelot has recently made a series of analyses of Egyptian gold, using the samples which he obtained from M. Maspero, the eminent Egyptologist, who is now director of the Museum of Antiquities in Egypt. M. Berthelot draws some interesting conclusions from these analyses, and has presented the subject to the Academy of Sciences. In the most ancient times, native gold found in alluvial deposits was used directly; it was usually combined with a certain percentage of silver. When this amount exceeded a few hundredths, it took the name of electrum, or asem, among the Egyptians. It is at a much more recent epoch that the silver was separated from the gold and the latter obtained in a pure state. In Lydia, where the first coins were made, this epoch may be fixed by the analysis of the coins preserved in the museums. It is the epoch of Cræsus; the coins of an anterior date are alloyed with silver. The process of separating gold from silver is described by Pliny; it is the cementation by the dry way of the metal in leaves, stratified with a mixture of chloride of sodium and sulphate of iron. The silver is eliminated in the state of double chloride, while the gold remains. This process has been employed throughout antiquity and during the Middle Ages up to the beginning of the sixteenth century, at which time the mints commenced to separate the metals by the wet process, by the methods still used at the present day, and whose description is given for the first time in manuscripts of the middle of the sixteenth century. M. Berthelot found it of interest to verify these inductions by the analysis of specimens of known date, taken from Egyptian tombs. The gold leaves which surround certain mummies seem to be especially adapted for this research; and several of these were obtained from M. Maspero. Their number is, however, too limited to permit of determining exactly the date at which the gold commenced to be completely purified from silver, but the analyses are of interest, in any case. The first was made with gold leaves of the sixth dynasty. Two analyses gave:

Gold.....	92.3	92.2
Silver.....	3.2	3.9
	95.5	96.1
Organic matter, etc.....	4.5	3.9

Tin, lead, copper, etc., were entirely absent. The proportion of iron is almost negligible. For the second series, gold leaves of the twelfth dynasty were used. These gave:

Gold.....	90.5	90.0
Silver.....	4.5	....
	95.0	....
Organic matter, etc.....	5.0	....

There is no considerable proportion of other metals. The third analysis was made with gold leaves of the Persian epoch, which gave 99.8 parts of gold. It is observed that the only pure gold is that of the Persian epoch, but as the interval between the two last analyses represents a period of ten centuries, an intermediate series would be useful for comparison.

#### The New Metallic Alloy Delta—Official Tests.

The associated copper foundries of Lyons and Macon have communicated to the Society of Mineral Industry the results of traction trials undertaken, under the direction of the navy, on the metal delta, says the *Moniteur Industriel*. The details of its properties are interesting. It is an alloy of copper, zinc and iron. It differs much from brass, both viewed from a mechanical standpoint and with reference to resistance to corrosion.

The tests of pieces designed for the "Casabianca," the "Jemmapes," and the "Valmy" indicate, for the cast metal, a range of elasticity varying from 15 to 18 kil. per square millimeter, and a rupture limit from 35 to 40 kil. with an elongation from 25 to 48 per cent. The diameter of the eprouvettes was 13.6 millimeters; the length was not stated. Heated, the limit of elasticity is not modified materially, at least at the temperature of 215° C. At the same temperature, the rupture charge sinks to 31 to 33 kil. The elongation rises 53 per cent. For most alloys the lengthening diminishes with the temperature.

Rolling extends the limit of elasticity to 30 to 34 kil. per square millimeter, and the rupture charge in the same ratio, which, on rolled pieces, varies from 52 to 75 kil., with an elongation from 20 to 26 per cent. The metal is easily forged at the deep red. At the cherry red, it burns and crumbles under the hammer. At the black, it becomes brittle and cracks. Between these limits, it is as malleable as lead. It is well adapted to stamping, allowing the formation of interchangeable pieces, of which the mechanical qualities are equal to those of the forged metal.

For mines, it presents advantages from its resistance to acid waters. Experiments at the collieries of Bonifacius in Westphalia bore on the comparison of this alloy with iron and steel. Rolled bars of each of these metals, kept for six and a half months in acid mine water, lost respectively 45 and 46 per cent of their weight for iron and steel and only 12 per cent for the alloy.

With an addition of 7 or 8 per cent of sulphuric acid in the water, the alloy does not lose sensibly of its weight in ten days. In particular, it has been employed in mines for timber fastenings and signal cables. The wheels of steam rotary pumps, corroded rapidly by acid waters, have been advantageously replaced with the metal delta.

#### SIX NATIONS VILLAGE AT THE PAN-AMERICAN EXPOSITION.

BY EDWARD HALE BRUSH.

Indians of the Six Nations' league are now at work upon the grounds of the Pan-American Exposition,



PAN-AMERICAN EXPOSITION—A SENECA CHIEF.

making the bark houses in which they are to live during the Exposition.

It is the purpose of this exhibit to turn back the pages of history several hundred years and show the Indians who then inhabited New York State and the customs they followed. Corn will be ground in stone mortars four hundred to five hundred years old, and bread will be made in the crude way then practised by the Six Nations. For the time being the Indians will discard what civilization has brought them, and live as their ancestors lived, ready for the battle or the chase. The Six Nations Indian exhibit will be of especial value to students, as interpreters will be provided, so that they may talk with the Indians themselves, and ask such questions as they desire concerning the utility of articles on exhibition, or concerning Indian customs.

It is even now possible to see within thirty miles of the Pan-American grounds in Buffalo the ancient customs, dances and other ceremonies of the Iroquois practised much as they were three hundred years ago. The dances are a strange admixture of the customs



PAN-AMERICAN EXPOSITION—GHOST DANCERS.

of the red man and the customs of the white man. The snake dance, for instance, is performed by red men who wear outing shirts in fast colors of the latest style, golf stockings and russet shoes, and by the Indian squaws who wear the bonnets of a Buffalo milliner.

In some of the dances the leading participants ordinarily dressed in many respects like their ancestors. In the "Feather Dance," Chief Maurice Green, a Seneca, recently wore a buckskin suit with a head-dress of horns and feathers. But next to him danced a brave who wore a gauze shirt, which might have been purchased at a Buffalo department store, as a

covering for the upper part of his body, knee breeches and long stockings, with bells at the knees, and a figured apron somewhat like that of a Mason. Most of the costumes were more or less fantastic, some typically Indian, others such as may be seen at an American masquerade bal.

The music to which the Indians dance is furnished by rattles formed of turtle shells filled with small stones and grains of corn. With these the Indian musicians beat upon the benches where they sit, and accompany the noise of the rattles by a wild monotone or sing song. It seems to be a point of honor, or an expression of loyalty to tribal custom and religion, for the pagan Indian to take part in these dances, and the aged chief, the gray-haired squaw, and the young mother with an infant in her arms join with the young buck and the Indian maiden in performing them. The pagan Indians predominate on this reservation, and it is the pagan Indians alone who preserve these customs, for it would be regarded as an evidence of backsliding from his faith for a Christian Indian to take any part in them.

At the Six Nations village on the Pan-American grounds next summer the dances and other ceremonies will be produced without the modern innovations.

Four mounds are being constructed on the grounds of the Exposition, near the Six Nations village, to represent the works of the ancient mound builders of North America. One mound will represent the mastodon in Wisconsin; another that designed to portray the serpent swallowing an egg; another the spread eagle mound, and still another, the burial mound. Usually these mounds were in form typical of some animal or object in nature. The burial mound, now completed, shows the burial pit and the cremation chamber and relics in them such as are generally found.

#### The Carthage of To-day.

A railway now runs to Carthage from Tunis. The summer palace of the Bey may be visited, but superficially. A walk through the courtyards is allowed, surrounded by thickly latticed windows, but one may not stand still within the precincts. Not on the direct road to Carthage, but easily reached during the same drive, is the museum at Bardo, opened in 1888 in the old harem adjoining the Bey's public palace, and full of most interesting results of recent North African excavating. Catalogues can hardly keep pace with discovery and additions, so that of many beautiful things a verbal description by the intelligent attendant comprises all available information. Especially rich in mosaics, the museum contains room after room filled with fine examples of wall and floor decoration, those found in Suza (Hadrumetum) being generally in a better state of preservation than the Carthage remains. The ancient inhabitants would seem to have pleased themselves by reproducing with their bits of colored stone many familiar scenes; and so "fishing," with men and boats and nets, a seashore banquet, quite elaborately worked out, the "chase," with dogs, hunters and flying game, appear. In 1897 a very large pavement design was discovered near Zajhrun, representing the signs of the zodiac in a circle, surrounded by the seven days of the week. In addition to the earlier mosaics, there are many exhibiting Christian designs. But mosaics by no means comprise the chief wealth of the museum. Hundreds of Punic lamps of earthenware are gathered, simple but showing graceful forms and decoration, weird masks with ingenious varieties of contortion in the features, tear vials and water jars, and fine bits of sculpture. Three statues have been recently excavated together at Carthage, perhaps the most beautiful at Bardo. The central figure in this exquisite group is thought to be a Ceres, and is more perfect than the others. A few fine relics in gold and silver are shown, and altogether the Musée Alaoui would be an enthralling spot for months of study.

#### Blackening Mites.

Frouessart relates in *Soc. Biologique* the discovery of an acarus inhabiting blackening. On opening an ordinary tin box, simply fastened by a band of paper pasted around the edge, the appearance of the contents was curious; and instead of the ordinary paste which we generally obtain in blackening, there was a friable mass resembling charcoal, on which was pasturing an innumerable host of whitish acari, grouped together like a flock of sheep.

Blackening paste is usually composed of molasses heated to 212°, of vegetable oil, superphosphate, gypsum, and carbon, the last three being the result of the action of vitriol on bone ash. Further, the mass may be sterilized with sublimate 1 to 20,000. The mixture contains at least three substances on which the acarus (*Tyroglyphus siro*) might feed—molasses, oil, and phosphate of lime. Experience has shown also that the proportion of mercuric salt is quite insufficient to prevent acarus, or even molds.