

MEXICAN PAPER.

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Twenty-four thousand resmas of paper were to be brought, yearly, as a tribute to the storehouses of the ruler of ancient Mexico—Tenuchtitlan.

We learn this from the painted tribute list which forms the second part of the oft quoted Codex Mendoza. There the fact stands, pictorially registered and clearly expressed.

We need not specify the reasons why out of no less than one hundred and sixty-three specimens of early Mexican industry, which are exhibited in the same list, we single out the article of *paper* and wish to make it the subject of discussion. Paper is generally acknowledged to be one of the most important agents of civilization. It is so to-day, and we are authorized to infer that it must have been so in ancient times. The quantity consumed stands in a direct ratio to the intellectual development of a nation. Whatever modification these two axioms may suffer if applied to statements connected with ancient Mexican society, any discussion that derives its main material from so legitimate a source as the above will be of interest to our readers, because it is likely to cast a new and somewhat clearer light upon the social and industrial status of that people. The disparagements as well as the exaggerations of which later writers are guilty, will find their best corrective in the records made by the people themselves.

Before, however, entering upon the several topics which have sprung from the subject in question, it is proper, first of all, that the interpretation we have given of the above mentioned pictures should be stated and verified.

In treating this point, we will follow the method adopted in a previous essay on the "Use of Copper."¹ To repeat what was said there in a more extended way, we advised the student to begin his work by consulting the Nahuatl dictionary for the word standing for that object, on whose characteristics and position in the tribute list he wishes to gather information. After having secured this word, we directed him to make an inspection of the Alphabetic Index, which the editors of the Kingsborough Collection published in Vol. V., pages 42-113. He would find in this index an enumeration of all the proper names and those of towns occurring in the Mendoza Codex, with the additional

¹ *Mexican Copper Tools*, in Proceedings of American Antiquarian Society, April 30, 1879.

and exact reference to volume, plate and corresponding picture in the named work. For, as that people had the habit of naming their towns from their most important product, the student would feel quite certain of detecting in the index the name of such a town and in such a form as to exhibit in its first syllables the word for the product from which it derived its name. Now, by the aid of these references the student cannot fail to find the picture which was used for representing the product. He will find the index referring to Volume I. of the Kingsborough Collection, at the beginning of the volume in which the Mendoza Codex is bound. This Codex is divided into three parts. The first contains the annals of the Aztec Tribe, the pictures of their rulers, the cities they conquered, and the signs for the years in which the events took place. The second part contains the pictures or coats of arms of the forementioned cities with the illustration of the product allotted to each of them to be paid as tribute. The third illustrates the education which the Aztec boys and girls received from their cradle to the time when they married. It is the first part of the Codex to which the index refers, and in which the town's name will be found pictorially represented in the shape of a house being destroyed by fire, which is the typical picture for conquest; and at its left side, connected with a string, is the representation of that product from which the town derived its name. In order to get at the name of the town or towns, compelled to pay this special article of tribute, as no particular reference is given for this idea, the reader must impress upon his mind's eye, very closely, the outlines as well as the minute details with which the painter has invested the picture. He will detect it somewhere on the pages of Part 2 of the Codex, which contains the tribute list, among an embarrassing multitude of specimens of its kind, mostly brought in visible connection with another picture, which is that of the tributary town.

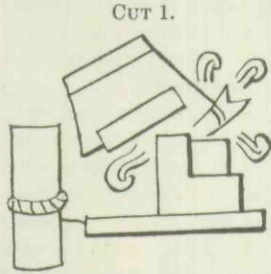
At this stage of research a difficulty arises, namely, that of recognizing the phonetic expression of the name embodied by the painter in this strange pictorial representation of a Mexican municipal coat of arms. This last information, however, may be derived from the text, which the viceroy Mendoza caused to be added to the precious Codex that bears his name. It will be noticed that each of the objects painted in the tribute-list was provided with a number, by the aid of which, together with that of the paged plate on which it stands, the student may refer to the explanatory text, Vol. V., Kingsborough Collection, pages 42-113, and thus become satisfied in regard to this first question.

Having thus explained the method of research to be followed, let us now proceed to show how it would work in connection with Mexican Paper.

In the Nahuatl language the word for *paper* is *amatl*.¹ The Index, Vol. V., Kingb. Coll., page 117, presents *Amatlan* as the name of a town,

¹ *Molina* (Fray Alonzo de), *Vocabulario en Lengua Castellana y Mexicana*. Mexico, 1571, page 4, verso.

with a reference to Vol. V., page 15, fig. 6. As indicated above, the picture which corresponds to this reference, and of which a facsimile is



shown in Cut 1, appears in the form of a piece of masonry from under whose crumbling roof smoke and flames burst forth. Near it, at the left, and appended to the drawing of the burning house, we notice another drawing concerning the character of which there cannot be the least doubt. It stands for a roll of paper. The shape, the white color and the string with which the sheet is tied, tell their own story. We are now certain that we have secured a

typical Mexican representation for *paper*, which in one way or another would always return in the same shape, when paper was to be illustrated. Remembering this picture we now pass to the inspection of the pages of Part 2, the Tribute-List, and find a very similar sign of paper on page 26. (See Cut 2.) Excepting for a slight deviation from our pattern, which shows the sheet cut straight, while this

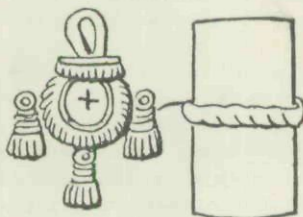
Cut 2. has the edges curved, and moreover, that from the upper edge something peeps out which looks like a black hooked nail, the two pictures, indeed, appear to be identical. Casting a glance at the plate on which the picture stands and understanding the arrangement given to the multitude of its colored companions, the student cannot fail to observe that on the left hand of the plate there is a series of pictures running perpendicularly up and down the page, which at the bottom turns a right angle to the right. Within this rectangular shaped series the painter placed the emblems for the towns, sixteen in number. All of them, as was the custom, exhibit the figure of a green hill, on whose front the product is painted from which the town derived its name. One picture, however, which is the 12th in number, is an exception to this rule. It does not appear drawn upon a green hill. This circumstance might perplex the student; and possibly cause him to doubt whether he sees the emblem for the town or that of the tribute itself. Therefore, he will do well to follow our advice, and with the aid of No. 12 picture and of No. 26 plate, consult the explanatory text, standing in Vol V., page 61, plate 26. There he will find the names enumerated for all the sixteen towns, and that of our No. 12 connected with "*the town of Yzamatitan, as tributary in eight thousand resmas of paper.*" Should the student at the same time feel curious enough to ask for the linguistic analysis of this name, his previous knowledge, that *Amatitan* means *paper-city*, would still be enriched by learning from the dictionary that the prefix *yz* (abbr. from *yzlli*) is the Nahuatl word for either *thorn* or *nail*. We cannot account for the motives that people had to weld the words *thorn* and *paper* into the body of a town's name, and refrain from making suggestions; but



we think that our analysis of the name can be accepted as correct from the fact, that in order to represent the name in the wonted ideographic style, the painter added to the sheet of paper the picture of the hooked object, which we are now authorized to consider a *thorn* or *nail*.

The picture for the town being found, it still remains for us to show where to look for that of the tribute itself and the eight thousand resmas, of which the text spoke. To get at this, we have no other guide than common sense. The painter, as will be noticed, omitted to express by any hint, to which of the emblems of the sixteen towns the articles of tribute belong, which fill the rest of the plate, on the right hand of the series of towns. Nor does the additional *résumé*, which was appended to the explanatory text, help us to a better understanding of the new problem. To be brief, the picture is to be sought on the following plate, 27, of which the text fortunately took care to state that it is a continuation of the preceding. This plate shows no perpendicular series of towns,—only a small horizontal row (17–21), five in number. Above it, among the various pictures, one strikes our eye at first sight—that which is numbered fig. 16. It reproduces exactly the former features of the drawing for paper, and this is the reason why this picture should not be connected with any other of the twenty-two towns, except that of *Yzamatitan*. We notice that it has an object appended at the left (see Cut 3), the meaning of which must be explained,

CUT 3.



since it is still new to us. It stands for the number *eight thousand*, which is always represented by a pouch or bag. It is trimmed with fringes, and as other ornaments there hang down on the sides two tassels and a third one below. On the front of the pouch we distinguish a little cross.

Here is the place to lay before our readers an epitome of the general

features of Mexican pictorial numeration.¹

Pictorial numbers were produced by the combination of only four symbols. 1) All units up to the number twenty were represented by a small circle or dot. 2) The number *twenty* itself was designated by a

CUT 4. flag (Cut 4) and was called *cempoalli*. 3) A third symbol was



the number *four hundred*, a feather standing up-right (Cut 5) called *cempoallipilli*. 4) For the number eight thousand, the pouch (Cut 3) was used. The system, therefore, was based upon

symbolizing the products of twenty.




¹ See *Leon y Gama*, Descripción Hist. y Cronológica de las dos Piedras, etc. Parte II., Appendix 2, page 128. Edit. C. M. Bustamante, Mexico, 1832.—*Anales del Museo Nacional de Mexico*, Tom. I, Entrega 6^{ma}, page 258.

For the natives started with the idea that in the ten fingers of the two hands, and the ten toes of the feet, nature herself had been so wise as to preindicate by what law they should govern themselves in their daily accounts. By the combination of the four symbols they managed to express any number they needed. The mode of arranging the units or dots was to set them by *fives*. For instance, the number twelve was

Cut 6. painted as in Cut 6 and nineteen as in Cut 7. We find, however, that in the case of expressing the number *seven*, the two units were not placed *beneath*, but in a line with the fives, yet in such a way as to mark the dis-



Cut 7. 

continuation. We learn this from a monument¹ in which the artist wished to express the days-date, 7 Acatl, as will be seen in Cut 8. When they had a year's date to express, they set it within a frame (see the first part of the Mendoza Codex), but always so that the fives were set lengthwise and the numbers less than five, sideways. So the year 13 Acatl was represented in the very same way, by painters and by sculptors. For this we

Cut 9.



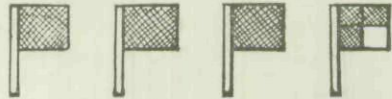
quote the Mendoza Codex, page 9, and the tablet at the top of the Mexican Calendar Stone (Cut 9). These instances will suffice to explain the method of writing units.

The combinations between twenty and four hundred were expressed by the symbol of the *flag*, so that two flags close together meant the number forty, three flags that of sixty, and so on. To express three hundred and forty-seven, they would have painted seventeen flags and seven dots. But they made varia-

tions in cases when the number could be divided by five; they then divided the field of the flags into four squares, and filled out only three squares, leaving the fourth square blank. In this way the number seventy-five would have been represented thus: (Cut 10). Cut 10.

This illustration is taken from Gama.

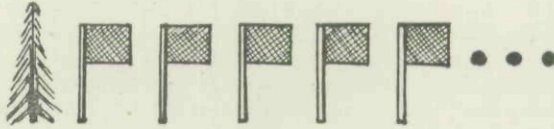
As four hundred was represented by a feather standing upright, the number five hundred and three would be painted in the following way: (Cut 11).



¹ The monument can be seen copied, in full, in the Spanish Translation of Mr. Prescott's work on the Conquest of Mexico, made by *Joaquin Navarro*, Mexico, 1845.

CUT 11.

One feather
five flags, and
three dots; but
if five hundred
and five were
the number,



then the sixth flag would be divided into four squares with three of them remaining blank.

There was no other sign, besides that of the pouch, beyond the number eight thousand.

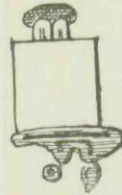
If we now revert to our subject, according to the explanation given we should infer that the pouch connected with the paper stands for eight thousand sheets of paper. However, we are warranted in stating that the amount was twenty times as much, hence 160,000 sheets. The multiplication by 20 comes in this way: The Mexicans, in wholesale, counted by collective numbers—as we do when we speak of eighteen score eggs or six reams of paper. This collective number was always twenty. Yet, according to the character of the objects, these twenties assumed different names. On the sale of poultry, fruits, and objects that were round or could be rolled, they counted by *stones* or *tell*. For objects or persons looked at in rows, like posts, stones or soldiers, they used the expression *walls* or *pantli*. Objects which were always sold one above the other, as dishes, plates, etc., were counted by *blankets* or *tlamañil*. All fruits that grew in grains, or seeds grouped around a centre, like maize, cacao, pineapples, and also bananas, were sold by cobs or *olotl*. All that could be hung up, as clothing or skins, were sold by *hangings* or *pilli*; and under this heading we find our object,¹ the paper, which they probably used to hang up for its better preservation in the humid climate, though we find it also mentioned among the objects counted by *tlamañil*. Now, as a tribute paid by *xiquipilli* or eight thousand undoubtedly will be considered a business conducted on wholesale, the amount of paper represented in our picture cannot fairly be counted by single sheets, but by scores, and therefore we must assume that the city of Yzamatitlan was tributary in 160,000 sheets of paper. Thus it is also expressed in the explanatory text, which with one exception,² always speaks of *resmas* (reams). Nor do we think we go too far in assuming that the painter tried to express this. We feel confident that if he had desired to indicate a tribute of single sheets, he would have drawn a plain sheet, and not, as he did, a bundle *tied with a rope*.

¹ *Molina*, u. s. pages 118—121; *La cuenta numeral en lengua Castellana y Mexicana*.

² This takes place on page 59, *Codex Mendoza*, Kgb. Coll., Vol. V, where the interpreter set down the word: *pliegos*, sheets. This is, however, a mere slip of the pen. For, returning to the same subject, he again employs the word *resmas*, as everywhere, in this connection.

We have not yet finished our search for "paper" in the tribute list. There is still another tribute picture of it registered on plate 24, which plate exhibits the same arrangement of towns and tribute articles as the former (Cut 12.) It bears the number 12, and does not strike the eye at first sight. The sheet of paper shows a yellow tint, and on its upper edge a pair of teeth is represented, the gums being of red flesh color, the teeth white and on the whole remarkably well drawn from nature. On the lower edge we notice a blue object attached, which is a typical symbol for *water*. The Spanish text, in Vol. V., page 59, gives the interpretation of this coat of arms as being that for the town of *Amacoztilla*. As the affix *coztic* means *yellow*, and as we were already informed that *amall* means *paper*, we learn by this analysis that the town, undoubtedly, was tributary of a certain sort of yellowish paper. Also in this case the picture for the tribute of paper must be sought on the next plate, 25, where it appears marked with the number 11, and becomes conspicuous by the pouch appended to it (Cut 13.)

CUT 12.



In order to gain more exact information, let us make use of the reference given through plate 24, fig. 12, and consult the text in Vol. V., page 60. We find again, that eight thousand resmas of paper were to be paid. Again, however, we miss the statement which of the sixteen towns appearing on the plate were tributary? Yet we think as before, that there is no other reasonable choice to make than to allot it to that of the town of *Amacoztilla*.

CUT 13.



There is still a last question to be solved. It arises from the circumstance, that in the *résumé*, appended to the text, Vol. V., page 60, we find the following remark: "All this tribute was given as a whole, and from six months to six months." Tribute, as a rule, appears to have been paid *annually*; and as the *résumé*, appended to the text mentioning the tribute of the town of *Yzamatitan*, is silent on this topic, we think that this town was no exception to the rule. In regard, however, to the town of *Amacoztilla*, we must accept the express statement made by the interpreter of a *semi-annual* tribute of paper. The reason for charging *Amacoztilla* with a double amount may be detected, in the yellow and therefore coarser quality of paper which it had to furnish. The Spanish *resma* (ream) is nothing else than an expression, which fortuitously coincided with the Mexican *pilli* or twenties. If therefore *Amacoztilla* yearly, gave 16,000, and *Yzamatitan* 8,000 resmas, and if each resma contained 20 sheets, our assertion at the head of these pages, that the yearly tribute of paper to the City of Mexico was of 24,000 resmas, equal to 480,000 sheets, may be considered to be correct.

In our previous dissertation on Mexican Copper Tools, we showed how by following up a certain method of research, the Codex Mendoza

can be made useful in eliciting facts which may cast light upon the ancient industrial status of those people. The present dissertation on "Paper" seems to give additional proof that the method stands its test, and may be employed, in future, with advantage. The student will consider that in consulting those pictures, he is going directly to the headquarters of information.

A few questions of interest arise in connection with our present article on Ancient Mexican Paper. Let us confine them to the subject—1) of its manufacture and different sorts, 2) of the form of its exaction as an article of tribute, and 3) of its employment for various purposes.

In order to give the discussion of these topics an authoritative basis, the reader, during its course, shall be made acquainted with all such passages and statements, as we were able to gather from the ancient writers.

In considering the manufacture of paper, our information on the processes which were in use, is scarce indeed. It is, however, sufficient to make us acquainted with the substances that were employed, so that by the aid of the combined data, any specific analysis likely to be undertaken of the various relics still in existence may the more readily afford us a definite result.

The first specimens of American paper which came to the hands of the Spaniards, were found, as it seems¹ on the coast of Vera Cruz immediately after Cortez's landing. They were covered with pictures bound in the form of books, and were sent to Spain among the presents which Cortez some time later received for his monarch from Moctezuma. So, at least, we may infer from the list of these presents,² in which appear "*Two books of those which the Indians have made,*" and "*Six specimens of drawings; another one which is red and has a few circles traced on it, and two specimens painted blue.*" On their arrival, Petrus Martyr, the Imperial Counsellor, as would be expected from a scholar, gave those Indian books a very close attention. He writes of them to Pope Hadrian in the following terms:³ "They do not

¹ *Torquemada*, Monarquia Indiana, IV., 19: Hallaron (Cortés) en un río, adonde despues se pobló Vera Cruz la Vijia . . . unos idolos, braseros para sahumar y muchos *libros de papel*. en que conservavan sus ritos y ceremonias, los sucesos de casos acaecidos é historias.

² This highly interesting document may be found printed in "Disertaciones sobre la Hist. d. l. Rep. Mexicana," por *D. Lucas Alaman*, Mejico, 1844, Tom. I., App. 2, pages 91—101. It is signed by the names of the two messengers (procuradores) Puerto Carrero and Franc. de Montejo, July 6, 1519. The text for our reference runs thus: "Mas dos libros de los de acá tienen los indios," (pag 99) and "Seis piezas de pincel: otra pieza colorada con unas ruedas y otras dos piezas azules de pincel."

³ *Petr. Martyr*, de Rebus Oceanicis, etc., Coloniae 1574, pag. 355, alin. 1, Dec. IV., 8. Non foliatim libros concinnant, sed in longum distendunt, ad plures cubitos: materias in quadratas reducunt partes, non solutas sed tenaci bitumine flexibili adeo conjunctas, us ligneis compactae tabellis, arguti librarij videantur manus subjisse. Quacunq; pateat liber apertus, duae sese facies offerunt, duae paginae apparent, totidem sub illis latent, nisi protendatur in longum.

bind them as we do, leaf by leaf, but they extend one single leaf to the length of several cubits, after having pasted a certain amount of square leaves one to the other with a bitumen so adhesive, that the whole seems to have passed through the hands of the most skilful book-binder. Whichever way this book was opened, it would always present two sides written and two pages appear, and as many folds, unless you extend the whole of it." "We have said before that these natives had books, and the messengers who were procurators for the new colony of Coluacana, together with other presents, brought many of them hither to Spain. The leaves of these books, upon which they write, are of the membrane of trees, from the substance that grows beneath the upper bark, and which they say is very scarce. It is not like that found in the willows or elms, but such as you find inside of certain edible palm trees, and which, resembling coarse cloth, grows between the intersecting leaves, precisely like network. These porous membranes they fill up with bitumen and render them pliable, and stretch to whatever form they please, and being made hard again, they cover them with a certain kind of gypsum. I, however, presume that the paper, which they (the messengers) have seen preparing, was made with a substance that is only similar to gypsum, beaten and then sifted into fine flour, and thus a substance prepared upon which one may write whatsoever would occur to him, and wipe it off with a sponge or cloth, and then use it again."

This statement is concise, and of remarkable clearness. There is a ring of truth in it, which makes us believe that the alleged messengers actually happened to be eye-witnesses of the act of paper-making by the Indians. Though the tree of which the membrane was taken is not named, it cannot be other than the so-called rubber tree (*Castiolo elastica*), whose ancient Nahuatl name of *amall* points directly to the office it once performed, and this word for the tree has survived in the language of the whole Central American people. What kind of resin was employed and what chalky powder² a future chemical

¹ Id. pag. 354. Diximus libros habere gentes has. Libros attulerunt unâ cum caeteris muneribus hi Coluacanae novi coloni, procuratores, nuncij, multos. Scriptibilia sunt eorum folia ex interiore arborum tenui cortice, sub libro superiore creato. Rarum ajunt esse: uti videmus non in saliceo aut ulmeo, sed uti cernere fas est in palmularum esui aptarum, tela dura folia exteriori intersectante: veluti retia foraminibus et maculis angustis contexta, bitumine tenaci retiacula compingunt. Adaptatam hinc formam mollefacta convertunt, et extendunt ad libitum, duremque facta liniunt gypso. Putandum est autem eos aliqua gypso consanguinea materia tabellas vidisse. Credendum est gypso in farinam cribrato superfultas, in quibus quicquid venit in mentem, scribi potest: dehinc spongia vel panulo deleri, ut denuo reiteretur. Ex ficum tabellis fiunt libelli, quos magnarum domorum dispensatores per fora secum ferunt, styloque metallico merces emptas coaptant, delendas quando jam in computatorios codices traduxerint.

² We take the following from Molina's Dictionary, page 159: "*xicaltell*, a certain varnish of white stone, upon which was painted or gilded; or

analysis will teach us, for there are specimens of such fibrous paper still in existence.¹

In connection with paper made of vegetable substance there is still another passage to be quoted. It comes from Bishop Landa,² whose long residence in Yucatan and among the Indians settled on the Atlantic coast of Mexico entitles him to be heard when he seeks to inform us on Indian paper manufacture. He says: "They wrote their books on a large and many-folded sheet, the whole of which they shut up within two nicely prepared boards. The writing was in columns and according as the folds run. It covered both sides. The paper was made from the *roots of a tree*, and was given a white lustre, on which they could write perfectly well."

From this statement it would appear that the roots of some tree had been employed as the main substance for manufacturing paper. The possibility of this cannot be absolutely denied, but Landa in this assertion stands alone among all other authors who have written on the same subject. We presume, however, that Landa's statement, in substance, tells the truth, and that he was careless only in the form of his expression. We interpret the passage in the following way:

It is the peculiarity of the rubber tree that after attaining its full development, the base does not present the plain round form of other trees. It presents a fanciful appearance, as if a large number of long triangular boards were grouped around the foot and were leaning against it in order to support its gigantic structure, a support which it needs, considering the wide expansion of its crown, and the hurricanes that occasionally sweep the forests. Without this system of natural buttresses the tree would not be able to stand. It would cost an immense amount of labor to fell the tree at its base. Therefore, after making a rude scaffolding, the stem is cut where all those taperings join

gypsum; or a certain smooth stone which served for polishing."—Since the native terms for substances of the kind are still in use, it will not be difficult for our Mexican colleagues to ascertain which special white stone was meant by *xicattell*, and how Molina's assertion that it served for coating as well as for polishing purposes must be understood.

¹ *Brasseur de Bourbourg*, in his edition of Diego de Landa's "Relation des choses de Yucatan," Paris, 1864, page 44, Note, draws the attention of the reader to the fact that a specimen of this amatl-paper is still preserved. He says: "c' est une sorte de papyrus, préparé avec grand soin, en tout semblable à celui de la *Bibliothèque Impériale* (Paris?) et recouvert d' un enduit analogue à celui de nos cartes de visites."

² *Diego de Landa by Br. de Bourbourg*, ib page 44 (§VII.) "que escribian sus libros en una hoja larga doblada con pliegues, que se venia a cerrar toda entre dos tablas que hacian muy galanas, y que escribian de una parte y de otra a columnas, segun eran los pleigos, y que este papel hacian de *raíces de un arbol*, y que le davan un lustre blanco en que se podia bien escribir — A later Yucatecan author, "Cogolludo, *Hist. de Yucatan*" (Madrid, 1608) Lib. IV. cap. V. page 185: "They had books in Yucatan made from the bark of trees and a white and lasting resinous substance (betun)," etc., etc.

to form the single trunk, which is often at the height of five to seven yards. After the lapse of a year the bark of those natural buttresses begins to dry and come off. It then needs only a little practice to peel off long pieces, which, when soaked and beaten, yield a membranous tissue, of which to this day, the poor savage Indians make use for a covering. In common Spanish parlance this lower portion of the trunk is simply called "*la raíz del palo*," or the *root of the tree*, and therefore it may be accepted fairly that Landa by speaking of "paper made from the roots of a tree," had in mind the described portion of the amatl-tree.

These two passages, taken from P. Martyr and Diego de Landa, are the only ones which we were able to find containing information on this kind of bark-paper. Since both seem to describe, however, only that special paper which was found to be in use with the Maya people, who lived on the Eastern Coast of Mexico, and no allusion is made to their acquaintance with any other mode of manufacturing, one may well ask, whether this process was traditional and peculiar only to the Mayas, and whether it was also a fact that they had no other material at hand for changing or improving the method? We cannot give an answer to this question; yet it is forced upon us, when we consider, that the immediate neighbors of the Maya, the Nahoas-speaking races, on the high plateaus of Anahuac, were found to manufacture paper in a widely differing way. They were said to have beaten the vegetable fibre of the maguey plant to a pulp, and to have extended the same in the form of a sheet. The Mayas occupied a zone of vegetation in which the amatl tree has its home, whilst the Nahoas had settled on the *mesas* of the Cordillera, where the tree does not exist.

Let us now consider the manufacture of paper as found among the Nahoas-Mexicans. The vegetable fibre, of which we spoke, was taken from the Maguey plant, a product of the colder, because higher, mountainous regions of Central America. The varieties of this Maguey plant are numerous. Modern botanists have taken care to discriminate in describing them. The reader may be pleased to learn what an accomplished Spanish scholar, Dr. Hernandez,¹ when writing on the medical use made in those countries of the various varieties of the

¹Rerum Medicarum Novae Hispaniae Thesaurus seu Plantarum, Animalium, Mineralium, Mexicanarum Historia ex *Francisci Fernandez Novi Orbis Medici Primarj relationibus in ipsa Mexicana Urbe conscriptis a Nardo Antonio Reccho. Collecta et in ordinem digesta a Joanne Terentio Lynceo, Romae, 1651, pag. 270: Metl plantae, quam Mexicanensi Maguei appellant . . . Tota enim illa, lignorum sepiendorumque; agrorum usum praestet. Caules lignorum, folia vero tecta tegendi, imbricum, lancium? (sic) *papyri* filique, ex quo calcei, lintea On the margin stands the following abstract from the introductory text: Differentia, forma, cultus, fractus, sepi, ligna, imbrica, filii, vestes, clavi, acus, succus, mel, saccharum, vinum, acetum, vires, restes, cibus.*

Maguey plant, said of the usefulness of that plant. We give only an abstract of it: "It furnished the people with fire and fence wood, with gutters, tiles and thatching material, with *paper*, and fibres from which shoes and cloth are made; they gather nails and needles from it, as well as fruits, wine, honey, sugar and vinegar. It is full of remedies against many diseases." Thus we have a learned authority for the fact that the natives actually worked up the Maguey in their preparation of paper. Which of the many varieties, however, was employed for the purpose, the Doctor does not state; nor are we able to say whether or not any information about it was left at all. If not, we feel tempted to make a suggestion. We find among eighteen varieties of Maguey or *metl* enumerated by the Doctor, one which is called by the natives *metl-coztli*. The name reminds us of that of the town of *Amacoztilla* (see above). Should a town or district of this name still be in existence, and a sort of Maguey there be cultivated, and the name *metl-coztli* still be in use, this circumstance might lead to the solution of the question, which of the many Maguey varieties the Mexicans selected for their purpose.

Among other early writers, who speak of paper, is Gomara,¹ the secretary of Hernán Cortez. He says: "of this *metl*, paper is made, which is used at their sacrifices and by the painters, and is found in every part of the country." None of the early chroniclers, however (at least none of those we had access to), have presented us with a description of how the paper itself was manufactured. It is only in the year 1746, that the Cavaliere Boturini,² a collector of Mexican relics informs us (yet from sources which he has omitted to quote), on the subject. "Indian paper was made from the leaves of the Maguey, which in the language of the natives was called *metl*, and in Spanish *pita*. The leaves were soaked, putrified and the fibres washed, smoothed and extended for the manufacture of thin as well as thick paper. After having been polished, they painted upon them. They also knew how to make paper from palm leaves, and I have in my possession a few samples of this sort, which are as smooth as silk." He is followed, in

¹ Gomara (Lopez de) *Historia de Mexico* etc. Anvers, 1554, page 344 sq. Del arbol Metl. Metl es un arbol, que unos llaman Maguey y otros cardon (thistle). Crece de altura mas de dos estados (man's height) y en gordor quanto un muslo de hombre. Es mas ancho debajo que de arriba, como cipres De la hoja deste metl hacen papel que corre por todas partes para sacrificios y pintores.

² Cavaliere Lorenzo Boturini Benaducci: *Idea de una nueva Historia general, y Catalogo del Museo Historico*. Madrid, 1746. Page 95. El papel Indiano se componia de las pencas del Maguey, que en lengua natural se llama *Metl*, y en Castellana *Pita*. Las echaban a podrir, y lavaban el hilo de ellas, el que habiendose ablandado, estendian para componer su papel grueso ó delgado, que despues bruñian para pintar en el. Tambien hacian papel de las hojas de Palma, y Yo tengo algunos de estos delgados y blandos tanto como seda.

1780, by Lorenzana,¹ in a paragraph entitled: "Paper on which they wrote," he says: "Paper was made from the leaves of the Maguei, which in Spanish is called Pita. The leaves of this plant were first soaked in water in order to putrify them. They then washed the fibres, smoothed them, and extended them for the manufacture of their coarse paper, which then was polished in order to print on it. They also had a fine sort of paper, made of palms, and white like silk, which I have seen; the leaves of the palms were gathered, ground, beaten and then polished." It will be noticed that when Lorenzana wrote these lines he was influenced by reading Boturini's text; and of both writers it may be stated with certainty, that neither of them ever saw the manufacture of paper. At their epoch, native art and industry had been buried for more than a century by the protective system, introduced in favor of Peninsula merchandise. Therefore, whatever was still known of the ancient industrial methods and devices, had only the character of dim tradition, and the distinction which our authors were able to make between coarse and fine native paper, draws its origin only from the opportunity they still had to handle and inspect many precious relics of the lost industry. Had Lorenzana been acquainted with the name of the palm tree, the leaves of which he says were employed for preparing the finer sort of "silk paper," he would have given it, as he did that of the "*pencas del Maguey*."

We have seen how little information can be drawn from the writings of the chroniclers. There is, however, one way left by which we may satisfy our curiosity to a certain degree. We may let the specimens of paper still in existence tell their own story. The difficulty only lies in their being scattered all over the world, and that those who own them would not wish to offer them for examination, for fear the precious relics might be damaged and thereby diminished in value. In this respect we have been more fortunate than we fear others will be. The Geographical Society of New York is in possession of an ancient Mexican painting, with the examination of which we were sometime ago intrusted. The result was, that it did not represent, as was expected, a topographical map of ancient Mexico—*Tenuchtitlan*, but the plan of a little village, a portion of which area the Spaniards had taken from the Indians illegally. The latter wished to show by the painting how much they were originally entitled to. The plan also bore a text, written in the Nahuatl language with antique Spanish letters, from which we could be satisfied as to the minor details of the complaint. It shows no year's date, yet from the fact that the Holy Office of

¹ Lorenzana (Don Francº Antonio de) Hist. d. l. N. España escrita por su esclarecido conquistador, Mexico, 1770, page 8: Papel, en que escribian. Metl, se hacia de las pencas de el Maguei o Pita, que llaman en España: las echaban a podrir en Agua, lababan el hilo de ellas ablandando le estendian para componer su papel grueso, que despues bruñian, para pintar en él.—Papel de Palma blando, y blanco como de seda, que le hé visto; cojian las ojas de Palma, las molian y batian y bruñian.

the Inquisition is mentioned in the text, we may trace the origin of this specimen of paper back to about the epoch of 1572, a date at which the Indians still were accustomed to prepare their own paper. Upon examining the specimen, we noticed—1) that the average thickness of the sheet did not exceed two mill. ^{mm}; 2) that the painted surface exhibited a yellowish tint, and the opposite surface a grayish hue, both surfaces however appearing to be polished; 3) the edges had the appearance of coarse cloth, when torn lengthwise; 4) it was noticed that one of the corners of the sheet had split open, so that when trying to widen the split in the same direction, the final result would have been to hold two thin sheets in one's hand; 5) when held against the light, the substance appeared cloudy, a few darker spots showing still the remnants of original fibres, and one which was still more dark, indicated a thickly matted mass of the same; 6) almost throughout the whole surface of the inner sides, it appeared to have been worked upon by something like a comb; but as the lines thus produced appeared to be lying within the borders of a parallelogram, one might guess that they had been produced by an instrument made for the express purpose of exerting an equal pressure upon the sheet in preparation; 7) A small specimen of the paper, when submitted to the examination of N. E. Waller, N. Y. Columbia School of Mines, gave the following results: "The substance does not contain any cotton fibres when seen under the microscope, but consists of fibres still surrounded with a thin *membrane* more or less torn and thrown into corrugated folds in some places. A very slight trace of gum appeared when this substance was boiled with water, and the solution tested with basic acetate of lead."¹

Another specimen of paper has been examined by Dr. E. Förstemann, the Superintendent of the Royal Library of Dresden, who at our request to furnish us with as exact information as possible in regard to the substance of which the paper of the so-called Dresden Codex is composed, was so kind as to answer on November 10th, and December 20th, 1880: "I suppose, you have been already informed through the press of the publication I made of the Dresden Codex, a most valuable document of ancient Yucatecan art and industry. The reprint has been issued by the Heliotypic Institute of Naumann in Leipzig, in however only fifty copies. In the preface, which I wrote to the reprint, you will find most of the questions you asked me answered, respecting the material, size and color of the painted sheets. Yet I most willingly hasten to condense my answer in the following terms—The size of the sheets is, 0.205 metres in length, and 0.085 metres in width. The

¹ In expressing our gratitude to the Society for having allowed us to examine a small specimen of this ancient paper, and our thanks also to the gentleman who was so kind as to test it by scientific method, we only wish that equal favor might be conferred upon all those students who should ask for the same in the interest of closer research.

ground color is throughout white, some reddish spots cropping out on the surface of the sheets, here and there. The white color originates from a coating of gypsum or lime and therefore is somewhat rough to the touch. According to tradition the material of the paper was taken from the metl-plant, and so indeed it appears to be upon examining the edges and angles of the various sheets, where the interior through use and handling was laid open to the eye. The meshed fibres are too fine and too white to come from the bark of a tree, and do not show its natural matting. It appears, finally, that the substance of the sheets was held or fastened together by thin *membranes*; whether or not they are animal membranes, I am unable to say. It is, however, not discernible that any of the 74 sheets, of which the Codex is composed, consists of two separate strata. You will appreciate the reason why I am prevented from sending a sample of the material, were it only a small one, and intended for chemical analysis.¹

These statements of Dr. Förstemann unveil a highly interesting fact, which when examining the chart preserved by the Geographical Society, had escaped our attention. For, if we are not mistaken in the tenor of his text, our learned friend noticed that each sheet consisted of a worked-up layer of Maguey fibres, both sides of which were covered with a thin *membrane*. Traces of these membranes were also observed in Dr. Waller's microscopical inspection. Some resinous substance then (see above) must have served as paste, and strong pressure exerted upon the prepared sheet made it appear as if both surfaces were of the substance of the dressing itself. It is only through the discovery of this membranous surface that the explanation is obtained, how these people succeeded in drawing and painting so

¹ When this article was preparing for press, we received a note written by Prof. Dr. Fr. Müller of the Royal Imperial Library, Vienna, in which he kindly answers a question we asked regarding the material of which the sheets of the so called Mexican Vienna Codex were manufactured. The note runs thus:—"Vienna, 12th January, 1881. Dear Sir: Immediately after the receipt of your last of Dec. 27, 1880, I had the Codex brought from the R. I. Library to my office. It stands registered in the catalogue under 'Mexican Codex on vellum.' In order to avoid any mistake, I engaged two friends of mine, who are zoölogists, to examine the substance of the sheets, and found the statement of the catalogue confirmed. The vellum is of deerskin, perhaps *Cervus Californ's*, and is prepared in a most peculiar way. I don't know whether this brief notice will be of any avail for your article. The Codex, however, shall be further examined, and with a special view to its technique of painting. Should then anything come to light, that would be of interest to you, I shall not fail of imparting it.

Truly yours, FR. MÜLLER, III. Marxergasse, 27, a."

The notice is, indeed, of value. If it does not prove what skin, it suggests the animal at least from which the *membrane* spoken of by Drs. Waller and Förstemann was probably taken. There is no animal in Central America except the deer, that furnishes so large a *membrane* as would be required to cover the surface of the sheets of paper referred to.

neatly as they did. For on examining the body of the fibrous substance, its coarseness afforded the fullest evidence that these fibres had not undergone such final process of maceration as is necessary to form the fine and slimy film, which after drying leaves an even surface to paint upon. Therefore, it was a *membrane* which furnished the painter with an even surface; the Maguey fibres formed only the body of the sheet.

There are many more questions to be answered, which stand in close connection with our subject. We are compelled to leave them open until we obtain the required data for undertaking their discussion.

Our subject is not "Mexican Paper" alone. We must view it also in the light of an article of tribute.

In order to better understand the way in which this business of collecting tribute was carried on, we cannot help adding a few preliminary remarks on the basis underlying early Mexican and Central American society. In plain words, this basis was Communism. Not, however, a theoretical or speculative communism, but a system of natural growth, and historical development. Our modern family, we may say, lives also more or less on the communistic plan. Yet each of its descendants, when come of age, is understood to make the effort of forming a new family, the head of which should work for its subsistence independently of parental aid. Not so with the Indians. The soil upon which the first family had settled, would be the common property of all after generations. No division of soil or property took place; inheritances, testaments, legacies were not known to them. The soil was tilled in common and its fruit divided in common. They considered themselves to be and to remain one single family, and even after having increased to the respectable size of a gens, and later on coming in contact with foreign gentes, to that of a tribe, they would act under the direction of the same principle. In order to watch and administer the complicated interests of this communistic kinship, a council of elders was elected, and for urgent cases this council was empowered to elect a chieftain, responsible to them and to the whole community.¹ The most frequent of such cases was war. War, on the victor's side meant receiving, on

¹ This conception of ancient Mexican society, will not astonish those who read Mr. Ad. F. Bandelier's recent publications on the subject, and take care to examine the premises by which this gentleman was brought to so surprising a conclusion. He has expounded his theory in three successive articles, which were published in the tenth, eleventh and twelfth Reports of the Peabody Museum of Archaeology and Ethnology, Cambridge, 1877, 1878 and 1879, under the titles: 1) "Art of War and Mode of Warfare of the Ancient Mexicans." 2) "The Distribution and Tenure of Lands, and the Customs with respect to Inheritance." 3) "Social Organization and Mode of Government of the Ancient Mexicans." The author comes to the acceptable results that Ancient Mexico was neither an Empire, nor a feudal Monarchy, nor ruled by a despotic power. "The Aztec tribe was organized after the principles of a barbarous, but free military democracy. The notion of abstract owner-

that of the vanquished paying tribute. In an organization, as described, in which every member considered itself connected to the others by the ties of blood, a comparatively small reverse or loss must necessarily have caused greater terror and more rapid defeat, than under similar circumstances to a military body in which the members were more or less strangers to each other; and if it was the chieftain who was captured or slain, the panic grew to such an intensity, that the forces felt paralyzed, desisted from fighting and surrendered. Now, respecting the Mexicans, we are circumstantially informed,¹ that they were neither agriculturists nor manufacturers. They drew their subsistence from systematic depredatory raids made upon their neighbors, and avoiding killing in battle as much as possible. In their engagements with the enemy, all they aimed at was to make captives.² Regarding these unhappy creatures, it is generally

ship of the soil, either by the nation, or state, or by the head of its government, was unknown to them. Definite possessory right was vested in the kinships composing the tribe, and conquest was not followed by the annexation of a tribe's territory, but by the exaction of a tribute, for the purpose of which special tracts were set off. Each of the twenty Mexican kins was governed by strictly elected officers, subject to removal. The kins delegated their power to transact business with outsiders to a general council which represented the Aztec tribe as a whole. The dignity of chief, commonly transformed into that of an emperor, was not hereditary, but a reward of merit." These are some of the main results aimed at by Mr. Bandelier in the research he made on ancient Mexican Society. It will readily be noticed that they stand in direct opposition to all which his predecessors had been teaching on this subject. We congratulate him sincerely upon his bold achievement. Not so much, however, because we think to have found in Mr. Bandelier a welcome confederate in our warfare against the extraordinary theories indulged in by the late Brasseur de Bourbourg, to whom he is an equal in enthusiasm, in vast reading and in constructive power, but because he has known how to master his emotional and intellectual agencies, and, in battling the most complex and contradictory historical material, has succeeded in arranging it in an array of lucid premises, which of themselves lead to a series of common-sense conclusions. The foot-notes he has given are indeed of an extension which appears uncommon. They occupy a space five times larger than the text. Yet as their contents are not reasonings, but abstracts taken from the ancient Spanish authors, whose works are not at every student's disposal, and as the author wishes to settle, once and forever, a point important in ancient Mexican history, we think this copiousness of quotations is not only excusable but necessary. It shows the author's circumspection, and the honest interest he has to make his reader judge for himself, the particular reasons why he should be induced to abandon a long-cherished doctrine and adopt the new one, which the author recommends. It will be impossible for this writer to agree with Mr. Bandelier upon each and every point. But this does not hinder him from endorsing the healthful tendency that pervades the whole work, nor from admiring the author's industry and steadfast earnestness displayed in so laborious a research.

¹ *Ad. F. Bandelier*, Art of War, l. c. page 96 sq. 19.

² *Id.* page 138, in note 164.

supposed, that as soon as they were brought to the capital, they were immolated to the gods. This is as improbable in itself as it is inconsistent with what we know on this subject. The religious tenets of the Mexicans, indeed required human sacrifices, and numerous executions of this kind have taken place. But this sacrificing fell upon only a small minority of the prisoners. By far the larger portion of them became slaves; yet these slaves, at the same time that they had to do the vilest services, were considered to be most precious hostages for the fulfilment of the treaty of peace with that tribe to which they had belonged, and of its most important condition, which was to pay a stipulated tribute. Each neglect of payment, and each rebellion, of course, endangered the prisoners' life. Therefore, whilst on the one hand the strong feeling for their kins' safety made the tribe meet its obligations, the victor, on the other hand, kept also in his possession a valuable security for having the tribute punctually paid.

If after these preliminary remarks we now revert to our subject, we may imagine how busily all members of the tribe at home must have worked in order to have the tribute articles ready for the day appointed. Many a tear must have dropped upon those gorgeously embroidered quilts and blankets, the specimens of which we now see pictured on the pages of the Mendoza Codex; and from the women's little treasures many dear keepsakes have been handed over with sighs and sobs, in order to be molten and cast into such shapes as the cruel enemy had prescribed. Yet there was also one thought and sentiment that must have softened their grief. The treasure they parted with, besides securing their own life, was destined to secure also that of the absent father or brother, while the making up of the exacted tribute performed in common, must have contributed to lighten the burden. The elders organized and surveyed the labor. They also collected and registered the articles. Carriers (*tamenes*) lifted them in well secured packs upon their backs, and after fastening the former by two straps which on their forehead joined to a broad belt (*mecapal*), with the elders (*quegues*) or speakers (*tlatoani*) at the front, they began the painful journey to the capital. But first, they had to wend their way towards the place in which the much feared Mexican *calpixque* (*calli*-house, *pixqui*-gatherer or custodian), the preliminary recipient of the tribute held his residence. He was usually an officer of high rank and heartily hated; for "besides his controlling position, he was also looked at as a spy, whose reports might at any time, bring down upon the pueblo the wrath of their conquerors, a living monument of the defeat with all its unfortunate results." If the place was very distant from the capital, the *calpixque* must have made appointments with other of his colleagues for a common place of rendezvous, and it must have afforded a picturesque spectacle to see this convoy in combined force moving through valleys and over hills and mountain passes toward the great City of the Lakes. Their arrival was sure to be welcomed with shouts

of joy and triumph, for each company of the carriers brought to the spectators the memory of a battle won, and more than all, each load under the weight of which they were aching, was destined to fill the empty store-house with new provisions for the year. The long list of articles received in the city on such an occasion, may be inspected in the Codex Mendoza.

It was, however, not the so-called Emperor of Mexico into whose treasure-house the tribute was delivered, and upon whose mercy and benevolence the distribution of the gifts depended. He had his share in them, and certainly a large one; but it was "the tribe, to which the tribute was due, and it was the tribal representatives to whom it was delivered. If the gathering of the tribute required a set of officers placed under the orders of the military chief, another set was needed for its preservation and judicious distribution. Every convoy was therefore consigned to a proper officer, the home steward. To him, the *pellacaltecatl*, or the man of the house of chests, the kins came for their share. Unfortunately we are unable to establish the principles upon which the division took place. All that we know is that the tribe received one portion and the kins or *calpulli* the other."¹ It is but natural to suppose, that if under these principles of distinction, one portion of the whole tribute, from the outset, was set aside to meet the general demands of tribal government, the remnant was divided into twenty shares, each of them to be received by the twenty *calpullis*, and that these again may have reserved one portion for the demands of their own special administration, and the remainder may have finally come to the possession of the individual or family homesteads.

Here is the place to consider the question how the above stated amount of paper-tribute was distributed among the members of that tribal community which resided in the City of Mexico—*Tenuchtitlan*. Though there is no special information, yet there are certain points of view, by which we may be guided in discussing and partly answering this query. First of all, it is judicious to assume that the amount of twenty-four thousand resmas, equivalent to four hundred and eighty thousand sheets, can hardly have been distributed *per capita*. This might be expected to have happened with the tribute of provisions and clothes, but not with the tribute of paper. Paper must have made an exception to the rule. It would have been a useless waste of the precious article to give each member of the *calpulli* a share of it, for the majority was not trained in the art of painting. This art was in possession of those only who were educated for the purpose. But if so, how can it be explained, that this guild of artists, the members of which must have been few in number, should have been able to consume for their special work the enormous amount of four hundred and eighty thousand sheets of paper? We are fully informed for what

¹For this and the foregoing verbal quotations see *Bandelier*, "Social Organization and Mode of Government," l. c. page 694, sqy.

different purposes paper was employed by these painters. They had to record the historical annals of the year, provide the priests with copies of the ritual calendar, register tributes, and in case of litigation on the limits of rural estates, to draft the map for the parties and the judge. The lack of a phonetic alphabet and writing had not yet allowed these people to indulge in the luxury of a voluminous literature. Their imperfect system of representing an event or an idea by means of objects or symbols, confined them to the recording of only the most important data of civic and religious administration. In this the reports of the Spanish chroniclers unanimously concur; and the paintings also which are left to us, confirm the impression that the records and therefore the use which the painters made of paper, was almost exclusively confined to the four above stated purposes of administration. It would be hazardous to average the number of sheets of paper used for these official purposes. However, we may safely advance, that only a minimum of the four hundred and eighty thousand sheets can have been consumed in this wise.

What disposition was made of the considerable remainder, we are, of course, unable to state in detail. But if, under certain conditions, one is allowed to make an inference from known facts, let us make use of this *modus colligendi*. There is a circumstantial report existing, made by one of the most reliable Spanish chroniclers respecting the religious festivities, which in Mexico were held at the beginning of each month. We shall give an abstract of this description, for on every occasion *paper* is stated to have been employed for dressing up the temples, idols, victims, priests and the whole concourse of performers themselves. The report, indeed, concerns only the monthly festivals, as being those of higher note. But the Mexican ritual calendar had this in common with the Oriental one, that every day was, so to speak, sanctified, having its special patron, before whose shrine it was the priest's duty to offer sacrifice by burning *balls of copal, hule and amatl* (resin, rubber and paper). If we now consider that the *copantl* (wall of serpents, which formed the large enclosure in the midst of which arose the structure of the famous pyramid), was studded with seventy-eight such shrines and oratories, each of which was to be attended *daily*, we may form an idea of the enormous quantity of paper that was consumed in the special department of worship alone.

Here are the suggestive data as furnished by Father Sahagun.¹ "In the first month, *Atlacoalo*, and on the occasion of its festival in all houses and palaces large poles were raised, at the top of which some strips of *paper* were fastened, sprinkled with drops of *ulli* (hule or rubber substance), and these papers were called *amateuilt* . . . The children to be sacrificed were dressed and adorned with *paper* of a red color . . . On another hill they dressed the children in *paper* showing

¹ Sahagun (*Bernardino de*) Hist. Univers. de las cosas de la N. España, Lib. I., Cap. 20, Tom. I., page 83, Ed. Bustamante.

alternately black and red stripes . . . On another hill the children were arrayed in *paper* of a blue color . . . On another in *dresses of paper* striped in black with the oil of the ulli . . . On another the dresses of the children were half red and half yellow . . . On the seventh hill, the whole dresses of the children were of yellow color, and on the shoulders they fastened a pair of wings, also of *paper*, so that they looked like angels. In the third month, *Tlacaxipehualitzli*, . . . after all was done as described, the master of the slave who died, placed in the yard of his house a round globe made of *petate* (mats), resting on three feet, and laid upon the top of the globe all the *paper* which the slave who died had been arrayed with. He then went out to look for some brave youth, to dress him with that very same *paper*, and gave him in one hand a shield and in the other a cane. . . . He then took the thigh bone of the captured slave, whose flesh he had eaten, and dressed the bone up with *paper* and hung it up by a rope on the same *polé*.—The fourth month, *Tletocoztli*, was devoted to the goddess Chicomecoatl. Every one had her image in his house, which was adorned with *paper*, and they placed food before her shrine . . . and sprinkled the ears of the maize with oil of ulli, and wrapped them up in *paper*.—In the fifth month, *Toxatl*, the festival of the god Tetzcatlipoca . . . young girls preceded bearing canes with *paper tassels* at the top, called *teletuiltl*, the paper was of different colors. Those who were rich did not ornament them with paper, but with woven ribbons, called *canaoc* . . . cages, to the sticks of which little *banners of paper* were attached . . . The noblemen wore *rosettes* made of *paper* on their foreheads . . . little *aprons of paper*, *amasmxlli*.—The sixth month, *Etzalqualitzli*, all carried on their backs bags fastened with cotton strings; some had fringes with cotton strings at the ends, and others striped colored *paper*. At the same time they pinned a large *rosette of paper* on the back of their necks, and on either side two smaller ones that made them look like two ears sticking out¹ . . . When they arrived at the bank of the lagoon, in which they desired to drown it (the child) *paper* was burned, as a sacrifice . . . During those four

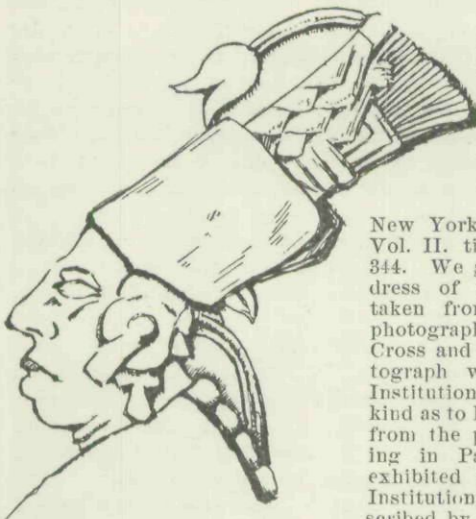
CUT 14.

¹ These passages give an interpretation of the true nature of those peculiar head-dresses, which are noticed on so many statues and statuettes found in Mexico and Central America. Two specimens of them are in possession of the Historical Society of New York and are exhibited in the upper tier of the Egyptian gallery. They were brought from Copan (Honduras). Another very fine specimen is in the National Museum of the city of Mexico, of which we give a copy, taken from Brantz Mayer's "Mexico as it was and is." New York and London: 1844, page 102. (Cut 14).



days, their inspectors prepared all the *ornaments of paper* required for the dresses of the priests as well as for themselves. Those ornaments were called *tlaquech paniotl*, which means neck-ornaments, the other rosettes, *amacuexpalli*; the bag in which the incense was carried, and which was *purchased* in the market, was also of *paper*. However the bags carried by the chiefs of rank were not of paper but of tiger-skin, the coloring of the paper bags of the poor being an imitation of the same . . . The high priest of the god Tlaloc wore on his head a crown, in the form of a basket, tight around his temples, and broader at the top, with many plumes hanging out.¹ He had his face besmeared with melted *ulli*, black like ink, and wore a jacket of shirting, called *aiatl*. The face, moreover, was covered by an ugly mask with a long nose, and his hair hung down to the girdle . . . they took all the offerings made of *paper*, the plumes, jewels and *chalchihuites* and carried them to the lagoon . . . they fastened the *paper* called *tetehuatl* at the top of a tall pole erected there . . . and threw into the censer four of those *tetehuatl*-papers, and made a gesture as if sacrificing, when the paper began to burn . . . The festival of the seventh month, *Tecuilhuitontli*, was devoted to the goddess of *Salt* . . . the image made of her showed that she bore on her head a kind of club, all studded over with *paper strips*, which were sprinkled with *ulli*, and with rosettes filled with incense. The eighth month, *Veytecuilhuitl* . . . the woman, destined to be sacrificed in honor of the goddess *Xilonen*, had her face painted with two different colors. From her nose downward it was of

CUT 15.



¹ The basket-formed crown will be found represented on the two tablets of the rear walls in the oratories of Palenque, the Temple of the Sun, and the Temple of the Cross. See John L. Stephens' "Incidents of Travel," etc.

New York, Harper & Bros. 1841, Vol. II. title, engraving, and page 344. We give a cut of the head-dress of the priest (Cut 15), as taken from M. Desiré Charnay's photograph of the Temple of the Cross and completed from the photograph which the Smithsonian Institution, Washington, was so kind as to have made for the writer from the portion of the slab missing in Palenque, which is now exhibited in the Museum of the Institution, and was recently described by Charles Rau, in "Smithsonian Contributions to Knowledge," Washington, 1879.

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yellow, and upwards to the forehead of red color, her head being adorned with a *paper crown* of four points. No mention is made that paper was used in the ninth month. In the tenth, *Xocotluetzi*, the statue of a man was prepared, which was made entirely of seeds of *bledo*. They robed it in *white paper*, no colors being allowed. They put a wig on its head, worked up from fine *strips of paper* and the body was dressed in a kind of *stola* of the *same material*, this *stola* falling from the left shoulder to above the right hip and *vice-versa*. Its arms were covered with sleeves of *corrugated paper* painted all over with images of birds, and its *apron (maxtli)* was also of *paper*. A pole was erected at each side of the statue, at the top of which something like a white shirt was floating, whilst the pole itself was hung all over with large *ribbons made of paper*, one half an arm's length broad, and ten arms long . . . The prisoners were painted all over their bodies with white color, the *apron* being of *paper*, and the *stola of paper* being arranged in the manner stated. Their *wigs* were also like that of the statue. The eleventh month, *Ochpanitzli* . . . They walked at the head of the procession, with their *maxtlis of corrugated paper*, and their shoulders studded with *rosettes of paper* as large as shields . . . each of them carried on their backs seven ears of maize, striped with liquified *ulli*. They were first wrapped in *white paper* and then in a richly embroidered cloth . . . The thirteenth month, *Tepeilhuitl* . . . and they covered them with *paper* of the kind they called *teteuiltl* . . . they wore *crowns of paper*, and *all the paper* in which they were dressed was sprinkled with liquified *ulli*. The fourteenth month, *Quecholli* . . . they took a stalk of the maize plant, which had nine knots, and fastened at its top a *paper* of the form of a banner, adorned with paper ribbons hanging down . . . the unfortunate victims were also dressed in their *robes of paper* . . . each of them bore in his hand a *paper banner* . . . The fifteenth month, *Panquetzalitzli* . . . they tore the wet robes off from the bodies of the slaves, dressing them with *those of paper* in which they were to sleep . . . one of the priests then stepped down from the *cue*, or hill of sacrifices, who carried in his hand a *large bundle of the papers*, called *tetepohualli* or *teteuiltl* . . . and another priest carried a kind of censer, *xihuh cohualt*, the top and end of which had the form of the head and tail of a serpent, the *tail being made of paper* two or three arms long. The fifteenth month, *Atemuztli* . . . One week before the beginning they *bought paper, ulli, cloth and knives*, and spent the nights in *cutting paper*, giving it that form which was called *teteuiltl* . . . and after being killed they tore from the body the *paper* in which they were dressed, and burnt it all in the yard of the same house . . . The seventeenth month, *Tititl* . . . the goddess *Illamatecutli*, who wore a *crown of paper*, in the shape of a mural crown . . . The eighteenth month, *Izcalli* . . . at the break of dawn they dressed the victims in their *paper gowns* . . . the dancers had their heads

adorned with a *crown of paper*, which looked like the half of a *mitra*.¹

These quotations will suffice to illustrate what we wished to prove.

We have come to the end of our article on ancient Mexican Paper. The abstract taken from Father Sahagun's report is full of data, showing for what other purposes than those of mere recording, paper was used among the people. Proof is given that a considerable use, nay waste of this material was made for the purposes of dress and all the finery with which these people were wont to make their appearance at their peculiar religious performances and ceremonies. However, we were also informed that paper was exposed for sale in the public markets. This circumstance is of no little weight in our attempt to answer the question: What may have become of the large remainder of the tribute. For we may fairly presume that if the purchase of paper was made accessible to all those who had means enough to buy it, a good deal of it would have found its way into the household of the families, and there not only have been cut up for the dress of the women, but also for that of the men. Whether or not this is mere conjecture, or substantiated by proof, the reader may decide after an inspection of the Mendoza Codex, in which the characters are represented as dressed, not for church ceremonies, but in their civic and gala costume.

¹ Torquemada (Juan de) in *Monarquía Indiana*, Lib. X. and XI., treats the same subject of the monthly festivals, and follows almost entirely his predecessor Sahagun, only that he cuts down his text. Torquemada, however, on various occasions has striven to increase it with new data, of which we quote the following: Lib. X. Cap. 29 on the festival of *Xiuhteuctli*, the god of Fire, they fastened to the shoulders of the masked men some papers folded like wings, in which were employed more than *four hundred sheets of paper*. See also Lib. XIII, Cap. 47, in which mention is made of passports of paper, covered with cabalistic symbols, which were put in the hands of the dead, in order that they might pass safely "through the gates of the two moving rocks, by the huge serpent, the crocodile, over the plains of cold and the large hill, and the region where the wind is more cutting than knives."

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