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WAS MIDDLE AMERICA PEOPLED FROM ASIA?

By Prof. EDWARD S. MORSE

The controversies over the question of the origin of Central American culture are to be again awakened by the exploration organized under the direction of the American Museum of Natural History through the liberality of its president, Morris K. Jesup, Esq. The plans embrace an ethnographic survey of the races between the Columbia and Amoor Rivers. Many similarities in customs, folklore, etc., will doubtless be found among these northern races. How far traces of an ancient avenue will be established through which came the unique cult of middle America, and for which in a way the surveys have been instituted, remains to be seen. The question is one of perennial interest, and all honor to the scientific spirit of Mr. Jesup, whose munificence has provided the means for this work.

It may be of interest to remind those who have only a vague idea of the contention that there are many earnest scholars who insist that the wonderful architectural remains in Mexico, Yucatan, and other regions of the west coast are due to Asiatic contact in the past. As proofs of this contact are cited similarities as seen in the monuments, the facial characteristics of certain tribes, ancient customs, astronomical ideas, serpent worship, certain games, etc. Particularly is it believed by the scholars that the "land of Fusang" mentioned in early Chinese historical records is no other than Mexico or some contiguous country.

Space will not permit even the briefest mention of the evidences which have led to these conclusions, and the reader is referred to a remarkably condensed history of the whole question embodied in a volume by Mr. Edward P. Vining entitled An Inglorious Columbus. Under this unfortunate title one may find the most painstaking collocation of the many memoirs written upon this subject, with the Chinese account of the land of Fusang in Chinese characters, and appended thereto the various translations of the document by De Guines, Williams, Julien, and other eminent sinologues.

To the French Orientalist, M. de Guines, we are indebted for our first knowledge of certain ancient records of the Chinese, which briefly record the visit of Chinese Buddhist monks to the land of Fusang in the year 458 of our era, and the return of a single Buddhist monk from this land in 499. De Guines's memoir appeared in 1761, and for forty years but little attention was drawn to it. Humboldt says that, according to the learned researches of Father Gaubil, it appears doubtful whether the Chinese ever visited the western coast of America at the time stated by De Guines. In 1831, Klaproth, the eminent German Orientalist, combated the idea that Fusang was Mexico, and insisted that it was Japan. In 1844 the Chevalier de Paravey argued that Fusang should be looked for in America. Prof. Karl Friedrich Neumann also defended this idea. In magazine articles in 1850-1862, and finally in book form in 1875, Mr. C. G. Leland supported with great ingenuity the idea of Chinese contact based on the Fusang account. In 1862 M. José Perez also defended the idea. In 1865 M. Gustave d'Eichthal published his memoir on the Buddhistic origin of American civilization, and in the same year M. Vivien de Saint-Martin combated the theory, and since that time many others have written upon the subject in favor or in opposition to the idea of Asiatic contact.

These hasty citations are only a few of the many that I have drawn from Mr. Vining's encyclopedic compilation.

It is extraordinary what a keen fascination the obscure paths of regions beyond history and usually beyond verification have to many minds, and the fascination is as justifiable as the desire to explore unknown regions of the earth. In the one case, however, we have a tangled mass of legendary tales coming down from a time when dragons were supposed to exist, when trees were miles in height, when people lived to a thousand years, when every unit of measurement was distorted and every physical truth, as we know it to-day, had no recognition, while in the other case we have at least a continuity of the same land and sea extending to the unexplored beyond. This impulse of the human mind finds an attractive problem in the question as to the origin of the American races. Dr. Brinton has insisted on the unreasonable nature of the inquiry by asking an analogous one: "Whence came the African negroes? All will reply, 'From Africa, of course.' 'Originally?' 'Yes, originally; they constitute the African or negro subspecies of man.'" By bringing together isolated features which have resemblances in common, the American Indian has been traced to nearly every known stock. Mr. Henry W. Henshaw, in an admirable address entitled Who are the American Indians? says: "If you have special bias or predilection you have only to choose for yourself. If there be any among you who decline to find the ancestors of our Indians among the Jews, Phœnicians, Scandinavians, Irish, Welsh, Egyptians, or Tartars, then you still have a choice among the Hindu, Malay, Polynesian, Chinese, or Japanese, or indeed among almost any other of the children of men." Had this address been written a few years later he might have added Hittite!

There are two propositions involved in the controversy as to the Asiatic origin of the American race: the one is that America was peopled from Asia by invasions or migrations in pre-savage or pre-glacial times; the other is that the peculiar civilization of Central America was induced by Buddhist monks, who traveled from Asia to Mexico and Central America in the fifth century of our era. Those who sustain the first thesis are without exception men trained in the science of anthropology; those who sustain the second thesis are with a few conspicuous exceptions travelers, geographers, sinologues, missionaries, and the like.

If Asia should ever prove to be the cradle of the human race, or of any portion of it which had advanced well beyond the creature known as *Pithecanthropus erectus*, then unquestionably an Asian people may be accounted the progenitors of the American Indians. Any effort, however, to establish an identity at this stage would probably take us far beyond the origin of speech or the ability to fabricate an implement.

The controversy has not raged on this ground, however; the numerous volumes and memoirs on the subject have dealt almost exclusively with culture contacts or direct invasions from Asia in our era, and more particularly with the supposed visits of Chinese Buddhist monks to Mexico and Central America already alluded to. Believing in the unity of the human race, the dispersion of the species seems more naturally to have occurred along the northern borders of the great continents rather than across the wide ocean. From the naturalist's standpoint the avenues have been quite as open for the circumpolar distribution of man as they have been for the circumpolar distribution of other animals and plants down to the minutest land snail and low fungus. The ethnic resemblances supposed to exist between the peoples of the two sides of the Pacific may be the result of an ancient distribution around the northern regions of the globe. Even to-day social relations are said to exist between the peoples of the Mackenzie and the Lena delta, and it is not improbable that the carrying band of the Ainu in Yeso and a similar device depicted on ancient codices and stone monuments in Mexico may have had a common origin. Advancing to a time when man acquired the art of recording his thoughts, the question of any contact between the peoples of the eastern and western shores of the Pacific, south of latitude 40°, compels us to examine the avenues which have been so potent in the distribution of life in the past – namely, the oceanic currents. We are at once led to the great Japan current, the Kuro Shiwo, which sweeps up by the coast of Japan and spends its force on the

northwest coast of America. Records show a number of instances of Japanese junks cast ashore on the Oregon coast and shores to the north.[1]

It must be evidences of Japanese and not Chinese contact that we are to look for – tangible evidences, for example, in the form of relics, methods of burial, etc. That the Japanese bear resemblances to certain northern people there can be no doubt. Dr. Torell brought before the Swedish Anthropological Society, some years ago, the results of a comparative study of Eskimo and Japanese. The anatomical and ethnographical resemblances appeared so striking to him as to give additional strength to the theory of the settlement of America from Asia by way of Bering Strait. That there are certain resemblances among individuals of different races we have abundant evidences. At a reception in Philadelphia I introduced a Japanese commissioner (who had been a Cambridge wrangler) to a full-blooded Omaha Indian dressed in our costume, and the commissioner began a conversation with him in Japanese; nor could he believe me when I assured him that it was an Indian that he was addressing, and not one of his own countrymen. I was told by an *attaché* of the Japanese legation at Washington that after carefully scrutinizing the features of a gentleman with whom he was traveling he ventured to introduce himself as a fellow-countryman, and found to his astonishment that the man was a native of the Malay Peninsula. That the Malays bear a strong resemblance to the Chinese is quite true. Dr. Baelz, of the Medical College of Japan, can find no differences between the crania and pelves of the Chinese and Malays. Wallace assures us that even the Malay of Java, when dressed as a Chinese, is not to be distinguished from them, and Peschel classifies the Malays with the Mongoloid people. In these approximate regions one might expect close intermixtures. If resemblances are established between the Japanese and the Eskimo, they would probably have arisen from a circumpolar race which has left its traces on northern peoples the world around. We turn naturally to Japan as the region from which a migration might reasonably have been supposed to take place. Its position on the Asiatic coast with a series of larger and smaller stepping-stones – the Kuriles – to Kamchatka, and thence across the strait to America and seaward, the broad and powerful Japanese current sweeping by its coast and across the Pacific, arrested only by the northwestern coast of America. With these various avenues of approach one might certainly expect evidences of contact in past times. A somewhat extended study in Japan of its prehistoric and early historic remains in the way of shell-heap pottery from the north to the south, much of it of an exceedingly curious character; the later stone implements, many of them of the most extraordinary types; the bronze mirrors, swords, spear points, and the so-called bronze bells; the wide distribution of a curious comma-shaped ornament of stone known as the *magatama*, with a number of varieties, and many other kinds of objects, leads me to say that no counterpart or even remote parallelism has been found in the western hemisphere. Certain rude forms of decoration of the northern shell-heap pottery of Japan, such as the cord-mark and crenulated fillet, are world-wide in their distribution, and a similar wide dispersal is seen of the rude stone implements and notched and barbed bone and horn. Here, however, the similarity ends. The lathe-turned unglazed mortuary vessels so common in ancient graves in Japan and Korea have equally no counterpart on our western coast. If now we examine the early records of Japan in her two famous works – the Kojiki and Nihonji, which contain rituals, ceremonies, and historical data going back with considerable accuracy to the third and fourth centuries of our era – we shall find many curious details of customs and arts and references to objects which have since been exhumed from burial mounds, yet we look in vain for a similar cult in Mexico or Central America. Turning aside from Japan as an impossible ground in which to trace resemblances, we glance at the unique character

[1] Mr. Charles Walcott Brooks presented to the California Academy of Sciences a report of Japanese vessels wrecked on the North Pacific Ocean in which many instances are given. He says: "Every junk found stranded on the coast of North America or on the Hawaiian or adjacent islands has, on examination, proved to be Japanese, and no single instance of a Chinese vessel has ever been reported, nor is any believed to have existed… There also exists an ocean stream of cold water emerging from the Arctic Ocean which sets close in along the eastern coast of Asia. This fully accounts for the absence of Chinese junks on the Pacific, as vessels disabled off their coast would naturally drift southward."

of the ancient pottery of Central America, with its representations of natural forms, such as fishes, turtles, frogs, shells, etc., its peculiar motives of decoration in color, and find no counterpart in Asia. The pyramidal rock structure and rounded burial mounds are supposed to have their counterparts in the East, but the pyramidal form is common in various parts of the world, simply because it is the most economical and most enduring type of architecture, and facilitates by its form the erection of the highest stone structures. The rounding dome of an earth mound and the angular side of a rock pyramid are the result of material only.

If we now turn to China as a possible region from which migrations may have come in the past, we have only to study the historical records of that ancient people to realize how hopeless it is to establish any relationship. Let one study the Ceremonial Usages of the Chinese (1121 B.C. – translated by Gingell), and he will then appreciate the wonderful advancement of the Chinese at that early date – the organized government, the arts, customs, manufactures, and the minute observances and regulations concerning every detail of life. With these records before him he may search in vain for the direct introduction of any art or device described in this old Chinese work. A few similarities are certainly found between the East and the West, but these arise from the identity in man's mental and physical structure. With two legs only, for example, it is found difficult to sit on a seat comfortably in more than a few ways. One may sit with both legs down, with one leg under, with legs crossed *à la* Turk, or the unconventional way throughout the world with one leg over the other at various angles. It would seem with this limited number of adjustments that any similarities in the attitude of certain stone statues in America and Asia could have but little weight. Prof. F. W. Putnam believes that he has established an Asiatic origin of certain jade ornaments found in Central America. If this conclusion could be sustained, we should then have evidences of contact with an Asiatic people in the stone age, which in itself was one of great antiquity for the Chinese, and one long antedating the origin of Buddhism. In the Chinese work above alluded to the whetstone is mentioned for sharpening swords, and the craft employed in polishing the musical stone. Confucius also refers to the musical stone in his Analects. This is as near as we get to the use of stone eleven hundred years before Christ. It is to the merit of Putnam to have first called attention to the fact that many of the jade ornaments, amulets, etc., of Central America had originally been portions of jade celts. The discovery is one of importance, whatever explanation may be reached as to the origin of the stone. In Costa Rica these celt-derived ornaments have been cut from celts composed of the native rock, and it would seem that these old implements handed down in the family led to their being preserved in the form of beads, amulets, etc., much in the same spirit that animates us to-day in making paper-cutters, penholders, and the like from wood of the Charter Oak, frigate Constitution, and other venerated relics. Among other evidences of contact the existence of the Chinese calendar in Mexico is cited. Dr. Brinton shows, however, that the Mexican calendar is an indigenous production, and has no relation to the calendar of the Chinese. In a similar way the Mexican game of *patolli* is correlated with the East Indian game of *parchesi* by Dr. E. B. Tylor. Dr. Stewart Culin, who has made a profound study of the games of the world, and Mr. Frank Hamilton Cushing, the distinguished student of the ethnology of southern North America, are both convinced that this game had an independent origin in various parts of the world. Mexican divisions of time marked by five colors are recognized as being allied to a similar device in China. The application of colors to the meaning of certain ideographs is common in other parts of the world as well. It is important to remark that the colors named include nearly the whole category as selected by barbarous people, and in the use of colors in this way it would be difficult to avoid similarities.

The evidences of contact in early times must be settled by the comparison of early relics of the two shores of the Pacific. Resemblances there are, and none will dispute them, but that they are fortuitous and have no value in the discussion is unquestionable. As illustrations of these fortuitous resemblances may be cited a tazza from the United States of Colombia having a high support with triangular perforations identical in form with that of a similar object found among the mortuary

vessels of Korea, and Greece as well. A curious, three-lobed knob of a pot rim, so common in the shell mounds of Omori, Japan, has its exact counterpart in the shell mounds of the upper Amazon. In the Omori pottery a peculiar curtain-shaped decoration on a special form of jar has its exact parallel in the ancient pottery of Porto Rico. These instances might be multiplied, but such coincidences as are often seen in the identity of certain words are familiar to all students. The account of the land of Fusang appears in the records of the Liang dynasty contained in the Nanshi, or History of the South, written by Li Yen-Shau, who lived in the beginning of the seventh century. It purports to have been told by a monk who returned from the land of Fusang in 499 of our era. This hypothetical region has been believed to be Japan, Saghalin, and Mexico. The record is filled with fabulous statements of impossible animals, trees of impossible dimensions, and is so utterly beyond credence in many ways that it should have no weight as evidence. If it had any foundation in fact, then one might infer that some traveler had entered Saghalin from the north, had crossed to Yeso and Japan, and found his way back to China. His own recollections, supplemented by stories told him by others, would form the substance of his account. The record is brief, but any one familiar with Japan as Klaproth was is persuaded with him that the account refers to Japan and adjacent regions. The twenty thousand *li* the monk is said to have traveled may parallel his mulberry trees several thousand feet high and his silkworms seven feet long. In a more remote Chinese record, as mentioned by Dr. Gustave Schlegel, the statement is made that the inhabitants had to dig down ten thousand feet to obtain blue tenacious clay for roofing tiles! A number of ardent writers convinced that signs of Chinese contact are seen in the relics of middle America have seized upon this account of Fusang in support of this belief. These convictions have arisen by finding it difficult to believe that the ancient civilizations of Mexico and Peru could have been indigenous. In seeking for an exterior origin in the Fusang account overweight has been credited to every possible resemblance, and all discrepancies have been ignored.

The fabulous account of the land of Fusang evidently supplied documentary evidence, and Mexico was conceived to be the mythical Fusang. Mr. Vining goes so far as to declare that "some time in the past the nations of Mexico, Yucatan, and Central America were powerfully affected by the introduction of Asiatic arts, customs, and religious belief." To establish the details in the Chinese account the entire western hemisphere is laid under contribution: now it is the buffalo of North America, then the llama of Peru, the reindeer of the arctic, or some native word. These writers do not hesitate to bring to life animals that became extinct in the upper Tertiaries, and to account for the absence of others by supposing them to have become extinct. Literal statements of horses dragging wheeled vehicles are interpreted as an allusion in Buddhist cult which refers by metaphor to attributes and not to actual objects. As an illustration of the wild way in which some of these resemblances are established, Mr. Vining quotes the account of M. José Perez (*Revue Orientale et Américaine*, vol. viii). Perez reminds us that the inhabitants of the New World gave Old World names to places in the new continent, citing New York, New Orleans, and New Brunswick as examples, and then says that at some remote epoch the Asiatics had given to the cities of the New World the same names as the cities of their mother country; so the name of the famous Japanese city Ohosaka (Osaka), to the west of the Pacific, became Oaxaca in Mexico on the eastern side. Now it is well known that the ancient name of Osaka was Namihawa; this became corrupted into Naniwa, and not till 1492 does the name Osaka appear. Rev. J. Summers gives a full account of these successive names with their meanings (Transactions of the Asiatic Society of Japan, vol. vii, part iv). The real question to be answered is not what might have been accomplished by ancient explorers from Asia, but what was accomplished. It is shown that Chinese Buddhist priests went to India in the years 388, 399, 629, and so on, and the question is asked, Why may they not have reached Mexico on the east? Migration on parallels of latitude with no intervening ocean is one matter; to go from latitude 30° on one side of the Pacific almost to the Arctic Ocean, and down on the other side nearly to the equator, is quite another exploit. It is assumed that five priests had gone to Mexico in 468 A.D., and there ingrafted Buddhistic cult on the races with whom they came in contact. It is simply beyond reason to believe

that the introduction of Buddhism into Mexico antedated by half a century its introduction into Japan. Communication between Korea and Japan has been from the earliest times one without effort or peril: in the one case a trip of a day or more, in the other case a journey of unnumbered thousands of miles through perilous seas, across stormy fiords and raging waters, including arctic and tropical climates and contact with multitudinous savage hordes. Those who hold that Mexico and Central America were powerfully affected by Asiatic contact must be called upon to explain the absence of certain Asiatic arts and customs which would have been introduced by any contact of sufficient magnitude to leave its impress so strongly in other directions. A savage people takes but little from a civilized people save its diseases, gunpowder, and rum. The contact of barbarous with civilized people results in an interchange of many useful objects and ideas, but these introductions must be through repeated invasions and by considerable numbers. Peschel, while believing in the Asiatic origin of the American race, would place the time far back in the savage state. He repudiates the Fusang idea, and expresses his belief that "a high state of civilization can not be transmitted by a few individuals, and that the progress in culture takes place in dense populations and by means of a division of labor which fits each individual into a highly complex but most effective organization," and then insists that "the phenomena of American civilization originated independently and spontaneously"; and Keane shows how interesting the social, religious, and political institutions of America become when "once severed from the fictitious Asiatic connection and influences." That the savage derives little or derives slowly from contact with a superior race is seen in the fact that he still remains savage. Thus the Ainu, a low, savage people, though they have been in contact with the Japanese for nearly two thousand years, have never acquired the more powerful Mongolian arrow release, while the Persians, though Aryan, yet early acquired this release from their Mongolian neighbors. The Scandinavians, who in prehistoric times practiced the primary release, yet later acquired the more efficient Mediterranean method. Let us for a moment consider what would have occurred as a result of an Asiatic contact with a people advanced enough to have been powerfully affected in their "arts, customs, and religious belief." It seems reasonable to believe that traces of a Mongolian release would be found in Central America, the more so as a warlike people would eagerly seize upon a more powerful method of pulling the bow, yet no trace of a stone or metal thumb ring has ever been found in the western hemisphere. Ancient Mexican codices, while depicting the archer, reveal no trace of the Mongolian method. In the Old World this release crept westward as a result of the migration of, or contact with, Asiatic tribes, and metal thumb rings are dug up on the Mediterranean littoral. While the arrow release of China might not have effected a lodgment in America, the terra-cotta roofing tile certainly would. This important device, according to Schlegel, was probably known in China 2200 B.C., in Korea 500 B.C., and in Japan in the early years of our era. In the ancient records of Japan reference is made to "breaking a hole in the roof tiles of the hall," etc., and green-glazed tiles are dug up on the sites of ancient temples in Japan. The fragments are not only unmistakable but indestructible. I have shown elsewhere[2] that the primitive roofing tile crept into Europe from the East, distributing itself along both shores of the Mediterranean, and extending north to latitude 44°. Graeber finds its earliest use in the temple of Hira in Olympia, 1000 B.C. The ancient Greeks had no knowledge of the roofing tile. Among the thousands of fragments and multitudinous articles of pottery found by Schliemann in the ruins of Ilios, not a trace of the roofing tile was discovered. One is forced to believe that so useful an object, and one so easily made, would have been immediately adopted by a people so skillful in the making of pottery as the ancient Mexicans. Certainly these people and those of contiguous countries were equal to the ancient Greeks in the variety of their fictile products. Huge jars, whistles, masks, men in armor, curious pots of an infinite variety attest to their skill as potters, yet the western hemisphere has not revealed a single fragment of a pre-Columbian roofing tile. Vining, in his work, cites an observation of the Rev. W. Lobscheid, the author of a Chinese grammar. In crossing the Isthmus of Panama this

[2] On the Older Forms of Terra-Cotta Roofing Tiles. Essex Institute Bulletin, 1882.

writer was much struck with the similarities to China; "the principal edifices on elevated ground and the roofing tiles identical to those of China." The roofing tile is indeed identical with that of China. It is the form that I have elsewhere defined as the normal or Asiatic tile, but it reached America for the first time by way of the Mediterranean and Spain, and thence with the Spaniards across the Atlantic, where it immediately gained a footing, and rapidly spread through South America and along the west coast north, as may be seen in the old mission buildings in California.

In China, Korea, and Japan the sandal has a bifurcated toe cord, the base of which, springing from the front of the sandal, passes between the first and second toes. It belongs to the Old World through its entire extent. It is the only form represented in ancient Egyptian, Assyrian, and Greek sculpture. One would have expected that with any close contact with Asian people this method of holding the sandal to the foot would have been established in Central America, yet one may seek in vain for the evidences of even a sporadic introduction of this method. Where representations are given in the sculptured stone pottery, or codex, the sandal is represented with two cords, one passing between the first and second and the other between the third and fourth toes. Dr. Otis T. Mason, who has given us an exhaustive monograph of the foot gear of the world, says that every authority on Mexico and Central America pictures the sandal with two cords, and he further says, in a general article on the same subject, "An examination of any collection of pottery of middle America reveals the fact at once, if the human foot is portrayed, that the single toe string was not anciently known."

The Thibetans, Chinese, Koreans, and Japanese have used the serviceable carrying stick from time immemorial. The nearest approach to this method in this country is seen in Guadalajara, where a shoulder piece is used to carry jars. The representation of this method shows that the pole rests across the back in such a manner that the load is steadied by both the right and left hand simultaneously – identical, in fact, with methods in vogue to-day through western Europe. We find, however, the northern races, as the Ainu and Kamchadels, use the head band in carrying loads, and this method has been depicted in ancient American sculpture. The carrying stick, so peculiarly Asiatic, according to Dr. Mason, is not met with on this continent.

With the evidences of Asiatic contact supposed to be so strong in Central America, one might have imagined that so useful a device as the simple chopsticks would have secured a footing. These two sticks, held in one hand and known in China as "hasteners or nimble lads," are certainly the most useful, the most economical, and the most efficient device for their purposes ever invented by man. Throughout that vast Asian region, embracing a population of five hundred million, the chopstick is used as a substitute for fork, tongs, and certain forms of tweezers. Even fish, omelet, and cake are separated with the chopsticks, and the cook, the street scavenger, and the watch repairer use this device in the form of iron, long bamboo, and delicate ivory. The bamboo chopstick was known in China 1000 B.C., and shortly after this date the ivory form was devised. Their use is one of great antiquity in Japan, as attested by references to it in the ancient records of that country. One may search in vain for the trace of any object in the nature of a chopstick in Central or South America. Knitting needles of wood are found in the work baskets associated with ancient Peruvian mummies, but the chopstick has not been found. Curious pottery rests for the chopsticks are exhumed in Japan, but even this enduring testimony of its early use is yet to be revealed in this country.

The plow in all its varieties has existed in China for countless centuries. Its ideograph is written in a score of ways. It was early introduced into Korea and Japan, and spread westward through the Old World to Scandinavia. There it has been found in the peat bogs. It is figured on ancient Egyptian monuments, yet it made its appearance in the New World only with the advent of the Spaniards. This indispensable implement of agriculture when once introduced was instantly adopted by the races who came in contact with the Spaniards. Even in Peru, with its wonderful agricultural development and irrigating canals, no trace of this device is anciently known, and to-day the tribes of Central and South America still follow the rude and primitive model first introduced by their conquerors.

If we study the musical instruments of the New World races we find various forms of whistles, flutes, rattles, split bells, and drums, but seek in vain for a stringed instrument of any kind. This is all the more surprising when we find evidences of the ancient use of the bow. If Dr. Tylor is right, we may well imagine that the lute of ancient Egypt was evolved from the musical bow with its gourd resonator (so common in various parts of Africa), and this in turn an outgrowth of the archer's bow, or, what at the moment seems quite as probable, the musical bow might have been the primitive form from which was evolved the archer's bow on the one hand and the lute on the other. Dr. Mason, in a brief study of the musical bow, finds it in various forms in Africa and sporadic cases of it in this country, and expresses the conviction that stringed musical instruments were not known to any of the aborigines of the western hemisphere before Columbus. Dr. Brinton is inclined to dispute this conclusion, though I am led to believe that Dr. Mason is right; for had this simple musical device been known anciently in this country, it would have spread so widely that its pre-Columbian use would have been beyond any contention. In Japan evidences of a stringed instrument run back to the third or fourth century of our era, and in China the *kin* (five strings) and *seih* (thirteen strings) were known a thousand years before Christ. These were played in temples of worship, at religious rites, times of offering, etc. It seems incredible that any contact sufficient to affect the religious customs of Mexico or Central America could have occurred without the introduction of a stringed instrument of some kind.[3]

In the Ceremonial Usages of the Chinese (1100 B.C.), a work already referred to, one may find allusions to a number of forms of wheeled carriages, with directions for their construction. Minute details even are given as to material and dimensions, such as measuring the spoke holes in the rim with millet seed (reminding one of the modern method of ascertaining the cubic contents of crania), all indicating the advanced development of wheeled vehicles. If from this early date in China up to the fifth century A.D., any people had found their way from China to middle America, one wonders why the wheel was not introduced. Its absence must be accounted for. It was certainly not for lack of good roads or constructive skill. Its appearance in this hemisphere was synchronous with the Spanish invasion, and when once introduced spread rapidly north and south. Like the plow, it still remains to-day the clumsy and primitive model of its Spanish prototype.

The potter's wheel is known to have existed in Asia from the earliest times; the evidence is not only historical, but is attested by the occurrence of lathe-turned pottery in ancient graves. We look in vain for a trace of a potter's wheel in America previous to the sixteenth century. Mr. Henry C. Mercer regards a potter's device used in Yucatan as a potter's wheel, and believes it to have been pre-Columbian. This device, known as the *kabal*, consists of a thick disk of wood which rests on a slippery board, the potter turning the disk with his feet. The primitive workman uses his feet to turn, hold, and move objects in many operations. The primitive potter has always turned his jar in manipulation rather than move himself about it. Resting the vessel on a block and revolving it with his feet is certainly the initial step toward the potter's wheel, but so simple an expedient must not be regarded as having any relation to the true potter's wheel, which originated in regions where other kinds of wheels revolving on pivots were known.

It seems reasonable to believe that had the Chinese, Japanese, or Koreans visited the Mexican coast in such numbers as is believed they did, we ought certainly to find some influence, some faint strain, at least, of the Chinese method of writing in the hitherto unfathomable inscriptions of Maya and Aztec. Until recently it was not known whether they were phonetic or ideographic; indeed, Dr. Brinton has devised a new word to express their character, which he calls ikonomatic. This distinguished philologist of the American languages confesses that not even the threshold of investigation in the solution of these enigmatical puzzles has been passed. Had the Chinese introduced

[3] Since the above was written Dr. Brinton and Mr. Saville have called my attention to such evidences as would warrant the belief in the existence of a pre-Columbian stringed musical instrument. The devices are, however, of such a nature as to indicate their independent origin.

or modified or even influenced in any way the method of writing as seen on the rock inscriptions of Central America, one familiar with Chinese might have found some clew, as was the case in deciphering the ancient writings of Assyria and Egypt. Grotefend's work on cuneiform inscriptions and Champollion's interpretation of Egyptian came about by the assumption of certain inclosures representing historic characters, which were revealed in one case by an inference and in another by an accompanying Greek inscription. If we examine the early Chinese characters as shown on ancient coins of the Hea dynasty (1756 to 2142 B.C.), or the characters on ancient bronze vases of the Shang dynasty (1113 to 1755 B.C.), we find most of them readily deciphered by sinologists, and coming down a few centuries later the characters are quite like those as written to-day. On some of the many inscribed stone monuments of Central America one might expect to find some traces of Chinese characters if any intercourse had taken place, whereas the Maya glypts are remotely unlike either Chinese or Egyptian writing. Some acute students of this subject are inclined to believe that these undecipherable characters have been evolved from pictographs which were primarily derived from the simple picture writing so common among the races of the New World.

It seems clearly impossible that any intercourse could have taken place between Asia and America without an interchange of certain social commodities. The "divine weed," tobacco, has been the comfort of the races of the western hemisphere north and south for unnumbered centuries: stone tobacco pipes are exhumed in various parts of the continent; cigarettes made of corn husks are found in ancient graves and caves; the metatarsals of a deer, doubly perforated, through which to inhale tobacco or its smoke in some form, are dug up on the shores of Lake Titicaca.

The question naturally arises why tobacco was not carried back to Asia by some of the returning emigrants, or why tea was not introduced into this country by those early invaders. A Buddhist priest without tea or tobacco would be an anomaly. There are many other herbs, food plants, etc., that should not have waited for the Spanish invasion on the one hand, or the Dutch and Portuguese navigator along the Chinese coast on the other.

Finally, if evidences of Asiatic contact exist, they should certainly be found in those matters most closely connected with man, such as his weapons, clothing, sandals, methods of conveyance, pottery making and devices thereon, musical instruments, and above all house structure and modes of burial. More remote perhaps would be survivals of language, and if the invaders had a written one, the characters, whether phonetic or ideographic, would have been left in the enduring rock inscriptions. If now a study of the aborigines of the western hemisphere from Hudson Bay to Tierra del Fuego fails to reveal even a remote suggestion of resemblance to any of these various matters above enumerated, their absence must in some way be accounted for by Asiaticists.

THE POSSIBLE FIBER INDUSTRIES OF THE UNITED STATES

By CHARLES RICHARDS DODGE

The wealth of any community is dependent on the variety and extent of its industries, the utilization of local natural resources, and the employment of the labor of all classes of its population. In locations of successful industrial operations the farmer derives increased incomes, the value of his products is greater, his lands of higher value, and the wages of agricultural labor larger. The rural population contiguous to large towns, therefore, is more prosperous than the larger farming contingent more remote from manufacturing or industrial centers. The farmers of the first class are prosperous because they have a home market for their dairy products, fruits, vegetables, and other "truck," which they are able to produce, for the most part, on small areas by high culture, while those of the second class are forced to expend their energies on commercial commodities such as cotton, wool, meat, grain, etc., with long hauls in transportation, and with heavy competition, international as well as domestic.

In times of depression, or when competition has grown too heavy, the cultivation of certain staples may cease to be remunerative, and the unfortunate producer is compelled to diversify his agriculture, or adopt some other means of livelihood.

Just such a misfortune has overtaken many farmers in the United States within the past few years. Within two years, in fact, wheat has been a drug in the market, while corn has been cheaper in some sections than coal, and cotton is now so low that it hardly pays to grow it, without considering the necessity, for the Southern farmer, of competing against the seventy-five thousand bales of Egyptian cotton which enter our ports in a year. Confronted with these conditions, there never has been a time when farmers were more anxious to discover new paying crops. Among the possible new rural industries that have attracted the attention of the agricultural class is that of fiber production, though the growth of certain kinds of fibers in past time has been a source of income to the country. Already there is a widespread interest in the subject throughout the West and South, and farmers are only seeking information regarding the particular practice involved in the cultivation of flax, ramie, and other fibers, cost of production, market, etc., but many are asking where the proper seed can be secured with which to make a start.

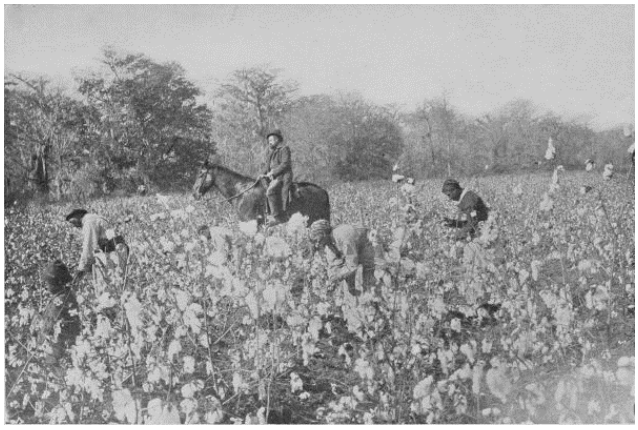
The importation of unmanufactured flax, hemp, textile grasses, and other fibers amounts annually to a sum ranging from fifteen million to twenty million dollars, while the imported manufactures of these fibers amount to almost double this value, or, in round numbers, approximately forty-five million dollars. With the establishment and extension of three or four fiber industries in this country, and with the new manufacturing enterprises that would grow out of such establishment and extension, an immense sum could be readily saved to the country, and the money representing the growth of these fibers would add just so much to the wealth of the farming class.

There are two ways in which we may arrive at a solution of this problem: by direct Government aid, and through the intelligently directed efforts of private enterprise.

Government experiments for the development or extension of vegetable fiber industries have been instituted, at different times, in many countries. In some instances these have been confined to testing the strength of native fibrous substances for comparison with similar tests of commercial fibers. Such were the almost exhaustive experiments of Roxburgh in India early in the present century. Another direction for Government experimentation has been the testing of machines to supersede costly hand labor in the preparation of the raw material for market, or in the development of chemical

processes for the further preparation of the fibers for manufacture. The broadest field of experiment, however, has been the growth of the plants under different conditions, either to introduce their culture, or to economically develop the industries growing out of their culture, when such industries need to be fostered. The introduction of ramie culture is an example of the first instance, the fostering of the almost extinct flax industry of our grandfathers' days an illustration of the second.

The United States has conducted experiments or instituted inquiries in the fiber interest at various times in the last fifty years, but it is only since 1890 that an office of practical experiment and inquiry has been established by the United States Department of Agriculture, that has been continuous through a term of years.



A Cotton Field in Mississippi.

In the present work the efforts of the Government have been mainly directed in the line of collecting and disseminating authoritative information relating to all branches of the industry, in importing proper seed for experimental cultivation, and in directing experiments, either on its own account or in co-operation with State and even private interests. The testing of new labor-saving machinery has also come within its province.

The subject in its details will be better understood by considering the list of the more important commercial fibers known to our market. The list is not a long one, for it barely reaches a total of fifteen species. The fibers of the first rank are the spinning fibers – namely, cotton, flax, hemp, jute; of the second rank, or cordage fibers, Sisal, Manila, Sunn and Mauritius hemps, and New Zealand flax; and of the third rank, Tampico, or ixtle, African fiber or palmetto, coir or cocoanut, piassaba, Mexican whisk, raffia, and Spanish moss, which are used in brush manufacture, in upholstery, and for other rough manufactures. Of these fifteen forms, only cotton, hemp, palmetto, and Spanish moss are produced in the United States in commercial quantity, though flax line has been produced to some extent in the past. Of those not produced in commercial quantity in this country, but which would thrive in cultivation, may be mentioned jute, New Zealand flax, Sisal hemp, cocoanut, and possibly Sunn hemp in subtropical Florida, with a few "substitutes," which will be mentioned hereafter.

I have neglected to mention in this list the sponge cucumber, a species of *Luffa* used as a bath sponge, which is imported from Japan in quantity, and which grows in the United States.

Passing the list of recognized commercial fibers, we come to a large number of species, forms allied to the above, that are either employed locally, chiefly by the natives in the countries where grown, or that would be capable of employment in the world's manufacture were they not inferior to the standard commercial forms at present recognized, and with which they would necessarily compete at a disadvantage. This list is a long one, for in the single genus *Agave*, to which belong the plant producing the Sisal hemp of commerce, there are over one hundred species in Mexico alone, more than one half of which would produce good fiber. In our own country it would be possible

to enumerate twenty species of plants that are recognized as American weeds, the fibers of which could be employed as hemp, flax, or jute substitutes were these materials unobtainable, besides half as many structural fiber plants similar to the agave, the products of which could be employed as cordage fiber substitutes in the same manner. Many of these uncultivated plants have been known to the aborigines for years, possibly for centuries, as we find their fiber, produced in varied forms of rude manufacture, in ancient tombs or other burial places.

Pulling Flax in Minnesota.

After exhausting the list of plants that may be termed commercial fiber substitutes, in different countries where they grow, there still remains a much larger list of species that are chiefly interesting in a scientific enumeration of those plants which produce in their stalks, leaves, or seed vessels what may be termed fibrous substance. My own catalogue of the fibers of the world already foots up over one thousand species of plants, and the complete catalogue for all countries might extend the list to a thousand more.

In considering the undeveloped fibers of the United States, it will be seen we should only recognize the actual commercial forms which we do not produce, but which may be produced within our borders, or such native growths as may be economically employed as their substitutes, and which possibly might be brought into commercial importance.

The hemp industry is already established, though it should be extended in order to recover its lost position among American rural industries. Where in the past we produced forty thousand tons of hemp in the United States, we now produce less than a fifth of this quantity. The cultivation of flax in the United States before the days of the present factory system was so widespread that it was of national importance. Its manufacture was largely a home industry, however, conducted by the fireside, and, as in ancient Greece and Rome, the work was performed by the women of the household. With the advent of the factory system came competition; the housewife laid aside her spinning wheel, the clumsy home-made loom fell into disuse, and the farmer grew no more flax for fiber. Then the flaxseed industry was extended, and after the close of the war a large demand sprang up for coarse fiber for the roughest of uses – for bagging and upholstery, in connection with hemp – and hundreds of little tow mills came into existence in the Middle and Western States.

The introduction of jute opened another chapter, and the decline of this crude attempt at a flax industry is recorded. Meanwhile some line flax was produced, but the extension of spinning and weaving establishments made a larger demand for this fiber, which was chiefly imported. Land in the old flax-growing States became more valuable for other crops, especially with the low prices brought about by foreign competition, and gradually the flax culture in the United States became a thing of the past.

Hackling Flax.

In recent years similar causes have served to operate against the industry in foreign flax countries where old and plodding methods are still in vogue, with additional factors in impoverished soils and high rental for land, and the cultural industry abroad is declining. With the opening of new and fertile Western lands in this country, and with the employment of the finest labor-saving agricultural implements in the world, the conditions are again changed, and are now favorable for American agriculture to re-establish this industry, and to make good a declining foreign supply. Our farmers are ready for the work, but they have not only lost their skill and cunning in producing the straw and preparing the fiber for the spinner, but new and more economical methods must be adopted to place the culture on a solid basis.

A million acres of flax are grown for seed annually, but the growth of flax for seed and flax for fiber are two very different things; moreover, Old World methods do not coincide with the progressive ideas of the educated farmers of the United States, for the peasant class does not exist in this country. A practice essentially American must be followed in order to make the culture profitable, and to equalize the difference in wages on the two sides of the Atlantic. This difference is more apparent than real, for it can be readily overcome by intelligently directed effort, by difference in soil fertility and rentals, and especially by the use of certain forms of labor-saving machines that already have been devised and are being rapidly improved. The "American practice," then, means, first, an intelligent practice, with a view to economy of effort and involving the use of machinery in the place of plodding foreign methods; and, second, the co-operation of farm labor and capital to the end of systematizing the work – i.e., the farmers of a community growing the flax, and capital, represented by a central mill, turning the straw when grown into a grade of fiber that the spinners can afford to purchase. Here is the solution of the flax problem in a nutshell. The scheme has already been tested in practice with favorable results, but the farmers in any community can do little until capital is more generally interested.

California Hemp.

This brings up an important point and presents another obstacle, for great harm has been done to all new fiber industries in recent years by the misdirected efforts of some professional promoters. In certain instances the organized fiber companies have been mere stock-jobbing concerns. They have had their rise and fall, men with idle money have burned their fingers, and the particular industry has received a "black eye."

The story of Government effort toward the establishment of the flax industry need not be told here; there has been widespread prejudice to overcome, with the opposition of the importers, discouragements to be studied and explained, the unvarnished truth to be told, and practical and authoritative information to be given to all who may seek it. The literature of the subject has been disseminated by thousands of copies, and new editions are being ordered.

As to the results: Superior flax has been produced in this country in limited quantities since the work began, and through extended field experiments flax regions have been discovered that are thought to equal the best flax centers of Europe. The department experiments in the Puget Sound region of Washington have demonstrated that we possess in that State a climate and soil that bid fair to rival the celebrated flax region of Courtrai, and from these experiments scutched flax has been produced that is valued by manufacturers in Ireland at three hundred and fifty dollars per ton, and hackled flax worth five hundred dollars per ton. Much has been done, but a great deal more remains to be accomplished in bringing together the farmer and capitalist in the practical work of growing, *retting, scutching, and preparing for market* American flax fiber, for questions of culture are settled.

Spreading Hemp in Kentucky.

We should restore our hemp industry to its former proportions by producing high-grade instead of low-grade fiber. The growth of a grade of American hemp that will sell for six to eight cents per pound, instead of three to three and a half cents per pound, as at the present time, means that our farmers must follow more closely the careful practices of Europe, and especially that they must adopt water retting in place of the present practice of dew retting, which gives a fiber dark in color and uneven in quality. A careful consideration of the practices of Italy and France as set forth in Fiber Report No. 11, Department of Agriculture, will materially aid those who desire to change their product from the cheaper dark hemps, for which there is small demand, to the higher-priced light hemps, which will compete with the imported commodity.

One of the most interesting problems of the day in the utilization of the new fiber material, and one that is attracting the attention of all civilized countries, is the industrial production of that wonderful substance known in the Orient as China grass, in India as rhea, and in Europe and America as ramie. The money spent by governments and by private enterprise throughout the world, in experiments and inventions, in the effort to establish the ramie industry, would make up the total of a princely fortune. Obstacle after obstacle has been overcome in the years of persistent effort, and now we stand before the last barrier, baffled for the time, but still hopeful, and with efforts unrelaxed. The difficulty may be stated in a few words: ramie culture will only become a paying industry when an economically successful machine for stripping the fiber has been placed on the market. Hundreds of thousands of dollars have been spent in efforts to perfect a machine, but no Government fiber expert in the world recognizes that we have such a machine at the present time, though great progress has been made in machine construction.

The world's interest in this fiber began in 1869, when a reward of five thousand pounds was offered by the Government of India for the best machine with which to decorticate the green stalks. The first exhibition and trial of machines took place in 1872, resulting in utter failure. The reward was again offered, and in 1879 a second official trial was held, at which ten machines competed, though none filled the requirements, and subsequently the offer was withdrawn. The immediate result was to stimulate invention in many countries, and from 1869 to the present time inventors have been untiring in their efforts to produce a successful machine. The commercial history of ramie, therefore, does not extend further back than 1869.

The first French official trials took place in 1888, followed by the trials of 1889, in Paris, at which the writer was present, and which are recorded in the official reports of the Fiber Investigation series. Another trial was held in 1891, and in the same year the first official trials in America took place, in the State of Vera Cruz, in Mexico, followed the next year by the official trials of American machines in the United States, these being followed by the trials of 1894. Since that year further progress in machine construction has been made, and a third official trial should be held in the near future.

Growth of Jute in Louisiana.

The first records of Chinese shipments of this fiber to European markets show that in 1872 two hundred or three hundred tons of the fiber were sent to London, valued at eighty pounds per ton, or about four hundred dollars. India also sent small shipments, but there was a light demand, with a considerable reduction in price, the quotations being thirty pounds to forty pounds per ton for Chinese and ten pounds to thirty pounds for the Indian product.

Those who are unacquainted with the properties and uses of this wonderful textile may peruse with interest the following paragraph from Fiber Report 7, on the Cultivation of Ramie, issued by the Department of Agriculture:

"The fiber of ramie is strong and durable, is of all fibers least affected by moisture, and from these characteristics must take first rank in value as a textile substance. It has three times the strength of Russian hemp, while its filaments can be separated almost to the fineness of silk. In manufacture it has been spun on various forms of textile machinery, also used in connection with cotton, wool, and silk, and can be employed as a substitute in certain forms of manufacture for all these textiles and for flax also, where elasticity is not essential. It likewise produces superior paper, the fineness and close texture of its pulp making it a most valuable bank-note paper. In England, France, Germany, Austria, and in our own country to an experimental extent, the fiber has also been woven into a great variety of fabrics, covering the widest range of uses, such as lace, lace curtains, handkerchiefs, cloth, or white goods resembling fine linen, dress goods, napkins, table damask, table covers, bedspreads, drapery for curtains or lambrequins, plush, and even carpets and fabrics suitable for clothing. The fiber can be dyed in all desirable shades or colors, some examples having the luster and brilliancy of silk. In China and Japan the fiber is extracted by hand labor; it is not only manufactured into cordage, fish lines, nets, and similar coarse manufactures, but woven into the finest and most beautiful of fabrics."

China is at present the source of supply of the raw product, and the world's demand is only about ten thousand tons, nine tenths of this quantity being absorbed in Oriental countries. The ramie situation in the United States at the present time may be briefly summarized as follows:

The plant can be grown successfully in California and in the Gulf States, and will produce from two to four crops per year without replanting, giving from two hundred and fifty to eight hundred pounds of fiber per acre, dependent upon the number of cuttings, worth perhaps four cents per pound. The machines for preparing this fiber for market are hardly able at the present time to clean the

product of one acre (single crop) in a day, and the fiber is quite inferior to the commercial China grass. A new French machine produces a quality of fiber which approaches the China grass of commerce, but its output per day is too small to make its use profitable in this country. All obstacles in chemical treatment of the fiber and in spinning and manufacture are overcome, and the world is waiting for the successful device which will economically prepare the raw material for market.

The part the United States Government is taking in the work is to co-operate in experiments, to issue publications giving all desired information regarding culture, the machine question, and the utilization of the fiber. It tests new decorticators and reports to the public upon their merits or demerits. It cautions farmers and capitalists, for the present, to go into the industry with their eyes open, for the professional promoter has seized upon this industry, above all others in the fiber interest, as one in which he can more readily gull a gullible public. Nevertheless, responsible capitalists are making every legitimate effort to place the manufacturing industry on a solid basis in this country, and to attain to the progress made in other countries where manufacture has already been established, and where the Chinese fiber is employed as the raw material.

A Florida Sisal Hemp Plant.

Thus far I have only considered spinning fibers. More than one half of the raw fibers imported in the United States are employed in the manufacture of rope and small twine, or bagging for baling the cotton crop. Cordage is manufactured chiefly from the Manila and Sisal hemps, the former derived from the Philippine Islands, the latter from Yucatan. Some jute is also used in this industry, though the fiber is more largely employed in bagging; and some common hemp, such as is grown in Kentucky, is also used.

We can not produce Manila hemp in the United States, and this substance will always hold its own for marine cordage. Jute will grow to perfection in many of the Southern States, but it is doubtful if we can produce it at a price low enough to compete with the cheaper grades of the imported India fiber. Rough flax and common hemp might be used in lieu of jute, in bagging manufacture, but the question of competition is still a factor. Sisal hemp, which has been imported to the value of seven million dollars a year, when prices were high, will grow in southern Florida, and the plant has been the subject of exhaustive study and experiment. This plant was first grown in the United States on Indian Key, Florida, about 1836, a few plants having been introduced from Mexico by Dr. Henry Perrine, and from this early attempt at cultivation the species has spread over southern Florida, the remains of former small experimental tracts being found at many points, though uncared for.

Pineapple Field in Florida.

The high prices of cordage fibers in 1890 and 1891, brought about by the schemes of certain cordage concerns, called attention to the necessity of producing, if possible, a portion of the supply of these hard fibers within our own borders. In 1891, in response to requests for definite information regarding the growth of the Sisal hemp plant, a preliminary survey of the Key system and Biscayne Bay region of southern Florida was made by the Department of Agriculture, and in the following year an experimental factory was established at Cocoanut Grove with special machinery sent down for the work. With this equipment, and with a fast-sailing yacht at the disposal of the special agent in charge of the experiments, a careful study of the Sisal hemp plant, its fiber, and the possibility of the industry was made, and the results were duly published. About this time the Bahaman Government became interested in the industry, and with shiploads of plants, both purchased and gathered without cost on the uninhabited Florida Keys, the Bahamans *began the new industry* by setting out extensive plantations on the different islands of the group. The high prices of 1890 having overstimulated production in Yucatan, two or three years later there was a tremendous fall in the market price of Sisal hemp, and Florida's interest in the new fiber subsided, though small plantations had been attempted. In the meantime, American invention having continued its efforts in the construction of cleaning devices, two successful machines for preparing the raw fiber have been produced which have, in a measure, superseded the clumsy *raspadore* hitherto universally employed for the purpose, and one of the obstacles to the production of the fiber in Florida is removed. The reaction toward better prices has already begun, and the future establishment of an American Sisal hemp industry in southern Florida is a possibility, though there are several practical questions yet to be settled.

Pineapple culture is already a flourishing industry in the Sisal hemp region. A pineapple plant matures but one apple in a season, and after the harvest of fruit the old leaves are of no further use to the plant, and may be removed. The leaves have the same structural system as the agaves – that is, they are composed of a cellular mass through which the fibers extend, and when the epidermis and pulpy matter are eliminated the residue is a soft, silklike filament, the value of which has long been recognized. Only fifty pounds of this fiber can be obtained from a ton of leaves, but, as the product would doubtless command double the price of Sisal hemp, its production would be profitable. How to secure this fiber cheaply is the problem. The Sisal hemp machines are too rough in action for so fine a fiber, and, at the rate of ten leaves to the pound, working up a ton of the material would mean the handling of over twenty thousand leaves to secure perhaps three dollars' worth of the commercial product. Were the fiber utilized in the arts, however, and its place established, it would compete in a measure with flax as a spinning fiber, for its filaments are divisible to the ten-thousandth of an inch.

The substance has already been utilized to a slight extent in Eastern countries (being hand-prepared) in the manufacture of costly, filmy, cobweblike fabrics that will almost float in air.

Another possible fiber industry for Florida is the cultivation of bowstring hemp, or the fiber of a species of *Sansevieria* that grows in rank luxuriance throughout the subtropical region of the State. The fiber is finer and softer than Sisal hemp, though not so fine as pineapple fiber, and would command in price a figure between the two. The yield is about sixty pounds to the ton of leaves. Many other textile plants might be named that have been experimented with by the Government or through private enterprise, but the most important, in a commercial sense, have been named.

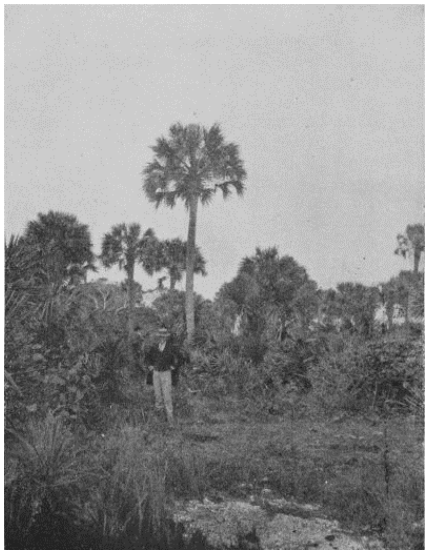
A Plant of New Zealand Flax.

There is a considerable list of plants, however, which are the subject of frequent inquiry, but which will never be utilized commercially as long as other more useful fibers hold the market. These for the most part produce bast fiber, and the farmer knows them as wild field growths or weeds. They are interesting in themselves, and many of them produce a fair quality of fiber, but to what extent they might be brought into cultivation, or how economically the raw material might be prepared, are questions the details of which only experiment can determine. But the fact that at best they can only be regarded as the substitutes for better, already established, commercial fibers has prevented serious experiment to ascertain their place. They are continually brought to notice, however, for again and again the thrifty farmer, as he finds their bleached and weather-beaten filaments clinging to the dead stalks in the fields, deludes himself in believing that he has made a discovery which may lead to untold wealth, and a letter and the specimen are promptly dispatched to the fiber expert for information concerning them. In such cases all that can be done is to give full information, taking care to let the inquirer down as easily as possible.

The limit of practical work in the direction of new textile industries is so clearly defined that the expert need never be in doubt regarding the economic value of any fiber plant that may be submitted to him for an opinion, and the long catalogue of mere fibrous substances will never demand his serious attention.

In studying the problem of the establishment of new fiber industries, therefore, we should consider "materials" rather than particular species of plants – utility or adaptation rather than acclimatization. We should study the entire range of textile manufacture, and before giving attention to questions of cultivation we should first ascertain how far the plants which we already know can be produced within our own borders may be depended upon to supply the "material" adapted to present demands in manufacture. If the larger part of our better fabrics – cordage and fine twines, bagging, and similar rough goods – can be made from cotton, flax, common hemp, and Sisal hemp, which

we ought to be able to produce in quantity at home, there is no further need of costly experiments with other fibers. Unfortunately, however, it is possible for manufacturers to "discriminate" against a particular fiber when the use of another fiber better subserves their private interests. As an example, common hemp was discriminated against in a certain form of small cordage, in extensive use, because by employing other, imported fibers, it has been possible in the past to control the supply, and in this day of trusts such control is an important factor in regulating the profits. With common hemp grown on a thousand American farms in 1890, the price of Sisal and Manila hemp binding twine, of which fifty thousand tons were used, would never have been forced up to sixteen and twenty cents a pound, when common hemp, which is just as good for the purpose, could have been produced in unlimited quantity for three and a half cents. The bagging with which the cotton crop is baled is made of imported jute, but common hemp or even low-grade flax would make better bagging. A change from jute to hemp or flax in the manufacture of bagging (it would only be a return to these fibers), could it be brought about, would mean an advantage of at least three million dollars to our farmers. Yet in considering such a desirable change we are confronted with two questions: Is it possible to compete with foreign jute? and can prejudice be overcome? For it is true that there are, even among farmers, those who would hesitate to buy hemp bagging at the same price as jute bagging because it was not the thing they were familiar with. But some of them will buy inferior jute twine, colored to resemble hemp, at the price of hemp, and never question the fraud.



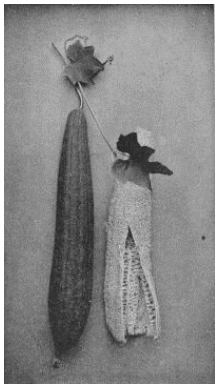
Cabbage Palmetto in Florida.

Our farmers waste the fibrous straw produced on the million acres of flax grown for seed. It has little value, it is true, for the production of good spinning flax, yet by modifying present methods of culture, salable fiber can be produced and the seed saved as well, giving two paying crops from the same harvest where now the flaxseed grower secures but one.

In summarizing the situation in this country, therefore, it will be seen that, out of the hundreds of fibrous plants known to the botanist and to the fiber expert, the textile economist need only consider four or five species and their varieties, all of them supplying well-known commercial products that are regularly quoted in the world's market price current, the cultivation and preparation of which are known quantities. Were the future of new fiber industries in this country to rest upon this simple statement, there would be little need of further effort. The problem, however, is one of economical adaptation to conditions not widely understood in the first place, and not altogether within control in the second.

Twenty flax farmers in a community decide to grow flax for fiber, and two of these farmers are perhaps acquainted with the culture. They go to work each in his own way; ten make a positive failure in cultivation for lack of proper direction, five of the remaining ten fail in retting the straw, and five succeed in turning out as many different grades of flax line, only one grade of which may come up to the standard required by the spinners. And all of them will have lost money. If the failure is investigated it will be discovered that the proper seed was not used; in some instances the soil was not adapted to the culture, and old-fashioned ideas prevailed in the practice followed. The straw was not pulled at the proper time, and it was improperly retted. The breaking and scutching were accomplished in a primitive way, because the farmers could not afford to purchase the necessary machinery, and of course they all lost money, and decided in future to let flax alone.

But the next year the president of the local bank, the secretary of the town board of trade, and three or four prosperous merchants formed a little company and built a flax mill. A competent superintendent – perhaps an old country flax-man – was employed, a quantity of good seed was imported, and the company contracted with these twenty farmers to grow five, ten, or fifteen acres of flax straw each, under the direction of the old Scotch superintendent. The seed was sold to them to be paid for in product; they were advised regarding proper soil and the best practice to follow; they grew good straw, and when it was ready to harvest the company took it off their hands at a stipulated price per ton. The superintendent of the mill assumed all further responsibility, attended to the retting, and worked up the product. Result: several carloads of salable flax fiber shipped to the Eastern market in the winter, the twenty farmers had "money to burn" instead of flax straw, and the company was able to declare a dividend. This is not altogether a supposititious case, and it illustrates the point that in this day of specialties the fiber industry can only be established by co-operation.



The Luffa, or Sponge Cucumber.

In all these industries, whether the fiber cultivated is flax, ramie, or jute, the machine question enters so largely into the problem of their successful establishment that the business must be conducted on a large scale. Even in the growth of Sisal hemp in Florida, should it be attempted, the enterprise will only pay when the necessary mill plant for extracting the fiber is able to draw upon a cultivated area of five hundred acres. In other words, the small farmer can never become a fiber producer independently, but must represent a single wheel in the combination.

The subject is a vast one, and, while I have been able to set forth the importance of these industries as new sources of national prosperity, only an outline has been given of the difficulties which are factors in the industrial problem. Summing up the points of vantage, the market is already assured; through years of study and experiment we are beginning to better understand the particular conditions that influence success or failure in this country; we have the best agricultural implements in the world, and American inventive genius will be able, doubtless, in time, to perfect the new mechanical devices which are so essential to economical production; our farmers are intelligent and

industrious, and need only the promise of a fair return for their labor to enter heart and soul into this work.

WHAT IS SOCIAL EVOLUTION?

By HERBERT SPENCER

Though to Mr. Mallock the matter will doubtless seem otherwise, to most it will seem that he is not prudent in returning to the question he has raised; since the result must be to show again how unwarranted is the interpretation he has given of my views. Let me dispose of the personal question before passing to the impersonal one.

He says that I, declining to take any notice of those other passages which he has quoted from me, treat his criticism as though it were "founded exclusively on the particular passage which" I deal with, "or at all events to rest on that passage as its principal foundation and justification."[4] It would be a sufficient reply that in a letter to a newspaper numerous extracts are inadmissible; but there is the further reply that I had his own warrant for regarding the passage in question as conclusively showing the truth of his representations. He writes: —

> Should any doubt as to the matter still remain in the reader's mind, it will be dispelled by the quotation of one further passage. "*A true social aggregate*," he says ["*as distinct from a mere large family*], *is a union of like individuals, independent of one another in parentage, and approximately equal in capacities.*"[5]

I do not see how, having small liberty of quotation, I could do better than take, as summarizing his meaning, this sentence which he gives as dissipating "any doubt." But now let me repeat the paragraph in which I have pointed out how distorted is Mr. Mallock's interpretation of this sentence.

> Every reader will assume that this extract is from some passage treating of human societies. He will be wrong, however. It forms part of a section describing Super-Organic Evolution at large ("Principles of Sociology," sec. 3), and treating, more especially, of the social insects; the purpose of the section being to exclude these from consideration. It is implied that the inquiry about to be entered upon concerns societies formed of like units, and not societies formed of units extremely unlike. It is pointed out that among the *Termites* there are six unlike forms, and among the Sauba ants, besides the two sexually-developed forms, there are three classes of workers – one indoor and two outdoor. The members of such communities – queens, males, soldiers, workers – differ widely in their structures, instincts, and powers. These communities formed of units extremely unequal in their capacities are contrasted with communities formed of units approximately equal in their capacities – the human communities about to be dealt with. When I thus distinguished between groups of individuals having widely different sets of faculties, and groups of individuals having similar sets of faculties (constituting their common human nature), I never imagined that by speaking of these last as having approximately equal capacities, in contrast with the first as having extremely unequal ones, I might be supposed to deny that any considerable differences existed among these last. Mr. Mallock, however, detaching this passage from its context, represents it as a deliberate characterization to be thereafter taken for granted; and, on the strength

[4] Nineteenth Century, p. 316.

[5] Aristocracy and Evolution, pp. 52, 53. The italics are his.

> of it, ascribes to me the absurd belief that there are no marked superiorities and inferiorities among men! or, that if there are, no social results flow from them![6]

Though I thought it well thus to repudiate the absurd belief ascribed to me, I did not think it well to enter upon a discussion of Mr. Mallock's allegations at large. He says I ought to have given to the matter "more than the partial and inconclusive attention he has [I have] bestowed upon it." Apparently he forgets that if a writer on many subjects deals in full with all who challenge his conclusions, he will have time for nothing else; and he forgets that one who, at the close of life, has but a small remnant of energy left, while some things of moment remain to be done, must as a rule leave assailants unanswered or fail in his more important aims. Now, however, that Mr. Mallock has widely diffused his misinterpretations, I feel obliged, much to my regret, to deal with them. He will find that my reply does not consist merely of a repudiation of the absurdity he ascribes to me.

The title of his book is a misnomer. I do not refer to the fact that the word "Aristocracy," though used in a legitimate sense, is used in a sense so unlike that now current as to be misleading: that is patent. Nor do I refer to the fact that the word "Evolution," covering, as it does, all orders of phenomena, is wrongly used when it is applied to that single group of phenomena constituting Social Evolution. But I refer to the fact that his book does not concern Social Evolution at all: it concerns social life, social activity, social prosperity. Its facts bear somewhat the same relation to the facts of Social Evolution as an account of a man's nutrition and physical welfare bears to an account of his bodily structure and functions.

In an essay on "Progress: its Law and Cause," published in 1857, containing an outline of the doctrine which I have since elaborated in the ten volumes of *Synthetic Philosophy*, I commenced by pointing out defects in the current conception of progress.

> It takes in not so much the reality of Progress as its accompaniments – not so much the substance as the shadow. That progress in intelligence seen during the growth of the child into the man, or the savage into the philosopher, is commonly regarded as consisting in the greater number of facts known and laws understood: whereas the actual progress consists in those internal modifications of which this increased knowledge is the expression. Social progress is supposed to consist in the produce of a greater quantity and variety of the articles required for satisfying men's wants; in the increasing security of person and property; in widening freedom of action: whereas, rightly understood, social progress consists in those changes of structure in the social organism which have entailed these consequences. The current conception is a teleological one. The phenomena are contemplated solely as bearing on human happiness. Only those changes are held to constitute progress which directly or indirectly tend to heighten human happiness. And they are thought to constitute progress simply *because* they tend to heighten human happiness. But rightly to understand progress, we must inquire what is the nature of these changes, considered apart from our interests.[7]

With the view of excluding these anthropocentric interpretations and also because it served better to cover those inorganic changes which the word "progress" suggests but vaguely, I employed the word "evolution." But my hope that, by the use of this word, irrelevant facts and considerations would be set aside, proves ill-grounded. Mr. Mallock now includes under it those things which I endeavored to exclude. He is dominated by the current idea of progress as a process of improvement, in the human sense; and is thus led to join with those social changes which constitute advance in social organization, those social changes which are ancillary to it – not constituting parts of the advance

[6] Literature, April 2, 1898.

[7] Westminster Review, April, 1857.

itself, but yielding fit materials and conditions. It is true that he recognizes social science as aiming "to deduce our civilization of to-day from the condition of the primitive savage." It is true that he says social science "primarily sets itself to explain, not how a given set of social conditions affects those who live among them, but how social conditions at one epoch are different from those of another, how each set of conditions is the resultant of those preceding it."[8] But in his conception as thus indicated he masses together not the phenomena of developing social structures and functions only, but all those which accompany them; as is shown by the complaint he approvingly cites that the sociological theory set forth by me does not yield manifest solutions of current social problems:[9] clearly implying the belief that an account of social evolution containing no lessons which he who runs may read is erroneous.

While Mr. Mallock's statements and arguments thus recognize Social Evolution in a general way, and its continuity with evolution of simpler kinds, they do not recognize that definition of evolution under its various forms, social included, which it has been all along my purpose to illustrate in detail. He refers to evolution as exhibited in the change from a savage to a civilized state; but he does not ask in what the change essentially consists, and, not asking this, does not see what alone is to be included in an account of it. Let us contemplate for a moment the two extremes of the process.

Here is a wandering cluster of men, or rather of families, concerning which, considered as an aggregate, little more can be said than can be said of a transitory crowd: the group considered as a whole is to be described not so much by characters as by the absence of characters. It is so loose as hardly to constitute an aggregate, and it is practically structureless. Turn now to a civilized society. No longer a small wandering group but a vast stationary nation, it presents us with a multitude of parts which, though separate in various degrees, are tied together by their mutual dependence. The cluster of families forming a primitive tribe separates with impunity: now increase of size, now dissension, now need for finding food, causes it from time to time to divide; and the resulting smaller clusters carry on what social life they have just as readily as before. But it is otherwise with a developed society. Not only by its stationariness is this prevented from dividing bodily, but its parts, though distinct, have become so closely connected that they can not live without mutual aid. It is impossible for the agricultural community to carry on its business if it has not the clothing which the manufacturing community furnishes. Without fires neither urban nor rural populations can do their work, any more than can the multitudinous manufacturers who need engines and furnaces; so that these are all dependent on coal-miners. The tasks of the mason and the builder must be left undone unless the quarryman and the carpenter have been active. Throughout all towns and villages retail traders obtain from the Manchester district the calicoes they want, from Leeds their woolens, from Sheffield their cutlery. And so throughout, in general and in detail. That is to say, the whole nation is made coherent by the dependence of its parts on one another – a dependence so great that an extensive strike of coal-miners checks the production of iron, throws many thousands of ship-builders out of work, adds to the outlay for coal in all households, and diminishes railway dividends. Here then is one primary contrast – the primitive tribe is incoherent, the civilized nation is coherent.

While the developing society has thus become integrated, it has passed from its original uniform state into a multiform state. Among savages there are no unlikenesses of occupations. Every man is hunter and upon occasion warrior; every man builds his own hut, makes his own weapons; every wife digs roots, catches fish, and carries the household goods when a change of locality is needed: what division of labor exists is only between the sexes. We all know that it is quite otherwise with a civilized nation. The changes which have produced the coherence have done this by producing the division of labor: the two going on *pari passu*. The great parts and the small parts, and the parts within parts, into which a modern society is divisible, are clusters of men made unlike in so far as they discharge the

[8] Aristocracy and Evolution, pp. 5, 7.

[9] Ibid., pp. 10, 11.

unlike functions required for maintaining the national life. Rural laborers and farmers, manufacturers and their workpeople, wholesale merchants and retailers, etc., etc., constitute differentiated groups, which make a society as a whole extremely various in composition. Not only in its industrial divisions is it various, but also in its governmental divisions, from the components of the legislature down through the numerous kinds and grades of officials, down through the many classes of masters and subordinates, down through the relations of shopkeeper and journeyman, mistress and maid. That is to say, the change which has been taking place is, under one aspect, a change from homogeneity of the parts to heterogeneity of the parts.

A concomitant change has been from a state of vague structure, so far as there is any, to a state of distinct structure. Even the primary differentiation in the lowest human groups is confused and unsettled. The aboriginal chief, merely a superior warrior, is a chief only while war lasts – loses all distinction and power when war ceases; and even when he becomes a settled chief, he is still so little marked off from the rest that he carries on his hut-building, tool-making, fishing, etc., just as the rest do. In such organization as exists nothing is distinguished, everything is confused. Quite otherwise is it in the developed nation. The various occupations, at the same time that they have become multitudinous, have become clearly specialized and sharply limited. Read the London Directory, and while shown how numerous they are, you are shown by the names how distinct they are. This increasing distinctness has been shown from the early stages when all freemen were warriors, through the days when retainers now fought and now tilled their fields, down to the times of standing armies; or again from the recent days when in each rural household, besides the bread-winning occupation, there were carried on spinning, brewing, washing, to the present day when these several supplementary occupations have been deputed to separate classes exclusively devoted to them. It has been shown from the ages when guilds quarreled about the things included in their respective few businesses, down to our age when the many businesses of artisans are fenced round and disputed over if transgressed, as lately by boilermakers and fitters; and is again shown by the ways in which the professions – medical, legal, and other – form themselves into bodies which shut out from practice, if they can, all who do not bear their stamp. And throughout the governmental organization, from its first stage in which the same man played various parts – legislative, executive, judicial, militant, ecclesiastic – to late stages when the powers and functions of the multitudinous classes of officials are clearly prescribed, may be traced this increasing sharpness of division among the component parts of a society. That is to say, there has been a change from the indefinite to the definite. While the social organization has advanced in coherence and heterogeneity, it has also advanced in definiteness.

If, now, Mr. Mallock will turn to *First Principles*, he will there see that under its chief aspect Evolution is said to be a change from a state of indefinite, incoherent homogeneity to a state of definite, coherent heterogeneity. If he reads further on he will find that these several traits of evolution are successively exemplified throughout astronomic changes, geologic changes, the changes displayed by each organism, by the aggregate of all organisms, by the development of the mental powers, by the genesis of societies, and by the various products of social life – language, science, art, etc. If he pursues the inquiry he will see that in the series of treatises (from which astronomy and geology were for brevity's sake omitted) dealing with biology, psychology, and sociology, the purpose has been to elaborate the interpretations sketched out in *First Principles*; and that I have not been concerned in any of them to do more than delineate those changes of structure and function which, according to the definition, constitute Evolution. He will see that in treating of social evolution I have dealt only with the transformation through which the primitive small social germ has passed into the vast highly developed nation. And perhaps he will then see that those which he regards as all-important factors are but incidentally referred to by me because they are but unimportant factors in this process of transformation. The agencies which he emphasizes, and in one sense rightly emphasizes, are not agencies by which the development of structures and functions has been effected; they are only

agencies by which social life has been facilitated and exalted, and aids furnished for further social evolution.

Respecting the essential causes of this social transformation, it must suffice to say that it results from certain general traits in human beings, joined with the influences of their varying circumstances.

Every man aims to pass from desire to satisfaction with the least possible hindrance – follows the line of least resistance. Either the shortest path, or the path which presents fewest impediments, is that which he chooses; and the like applies to courses of conduct at large: he does not use great effort to satisfy a want when small effort will do. Given his surroundings and the occupation he chooses, when choice is possible, is that which promises a satisfactory livelihood with the least tax on such powers as he has, bodily and mental – is the easiest to his particular nature, all things considered. What holds of individuals holds of masses of individuals; and hence the inhabitants of a tract offering facilities for a particular occupation fall into that occupation. In § 732 of the *Principles of Sociology* I have given from various countries illustrations of the ways in which local conditions determine the local industries: – instance among ourselves mining districts where there are coal, ironstone, lead, slate; wheat-growing districts and pastoral districts; fruit and hop districts; districts for weavers, stockingers, workers in iron; places for shipbuilding, importing, fishing, etc.: showing that certain sections of the population become turned into organizations for the production of certain commodities, without reference to the directive agency of any man. So in each case is it with the various classes of merchants, shopkeepers, professional men, etc., who in each of these centers minister to those engaged in its special industries: nobody ordering them to come or to go.

Similarly when we pass from production to distribution. As in India at the present time, where a Juggernaut festival is accompanied by a vast fair; as, according to Curtius and Mommsen, in Greece and Rome, the gatherings of people to make sacrifices to the gods were the occasions for trading; so in Christian times, church festivals and saints' days, drawing assemblages of people for worship, led to active exchange of commodities – the names of the fairs proving their origin. This was not arranged by any one: it arose from the common sense of all who wanted to sell some things and buy others. There has been a like history for the rise of markets, and the transition from weekly to bi-weekly, and finally to daily, markets in respect of important things – corn, money, securities. No superior man, political or other, dictated these developments. When barter gave place to exchange by means of a currency, the like happened. One wanting to dispose of surplus goods, meeting those who had no personal need for such goods, took in exchange certain things in universal demand, which he knew he would be able to pass on in like manner – in early stages articles of food, of warmth, of defense, of ornament; and from such articles arose in each case a currency – here dried fish, there tea-bricks, and in other cases skins, bundles of cotton, here standard bars of rock salt, there standard bars of iron, in one place definite lengths of cloth, and in another fine mats, and in many places ornaments and the materials for ornaments: which last, gold and silver, being relatively portable, passed into wide use. These precious metals were at first in quantities actually weighed; then in quantities of professed weight; and finally in quantities bearing the king's stamp as being the most trustworthy. No great man – political, industrial, or other – invented this system. It has everywhere resulted from men's efforts to satisfy their needs in the easiest ways. So was it with the transition from a currency of intrinsic value to one of representative value. When, instead of a direct payment in coin, there came to be used a memorandum of indebtedness to be presently discharged, which could be transferred to others – when, as in Italy, to save the weighing and testing of miscellaneous coins, there arose the practice of depositing specified quantities with a custodian and having from him negotiable receipts – when, as in England, the merchants, after having been robbed by the king of their valuables, left for security in the Tower, sought safer places, and, depositing them in the vaults of goldsmiths, received in return "goldsmiths' notes," which could pass from hand to hand; there was initiated a paper-currency. Goldsmiths developed into bankers; after central banks there arose provincial banks; promises to pay became to a great extent substitutes for actual payments; and

presently grew up the supplementary system of checks, extensively serving in place of coin and notes. Finally, bank-clerks in London, instead of presenting to the respective banks the many and various claims upon them, met and exchanged these claims and settled the balance: whence presently came the clearing house. No superior man arranged all this. Each further stage was prompted by the desire to economize labor. From primitive fairs up to the daily transactions of the money market, distribution and exchange have developed without the dictation of any great man, either of Mr. Carlyle's sort or of Mr. Mallock's sort. It has been so throughout all other arrangements subserving national life, even the governmental. Though here at least it seems that the individual will and power play the largest part, yet it is otherwise. I do not merely refer to the fact that without loyalty in citizens a ruler can have no power; and that so the supremacy of a man intrinsically or conventionally great is an outcome of the average nature; but I refer to the fact that governmental evolution is essentially a result of social necessities. On tracing its earliest stages from savage life upwards, it becomes manifest that even a ministry is not the mere invention of a king. It arises everywhere from that augmentation of business which goes along with increase of territory and authority: entailing the necessity for deputing more and more work. Under its special aspect it seems to be wholly a result of the king's private action, but under its general aspect it is seen to be determined by the conditions of his existence. And it is so with governmental institutions at large. Without tracing these further it will suffice to quote the saying of Macintosh – "Constitutions are not made but grow."

Конец ознакомительного фрагмента.