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### **Contributors**

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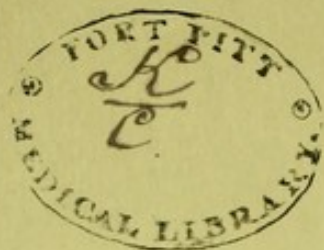
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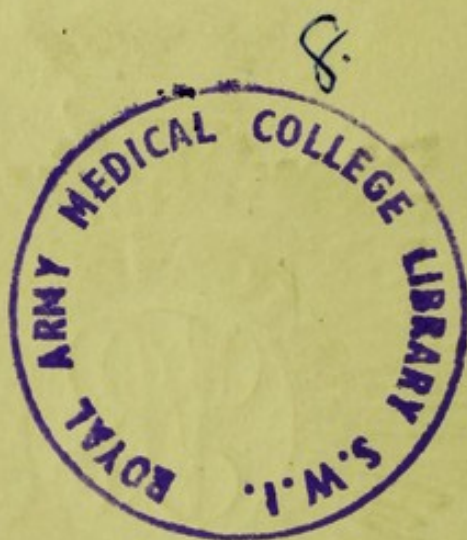
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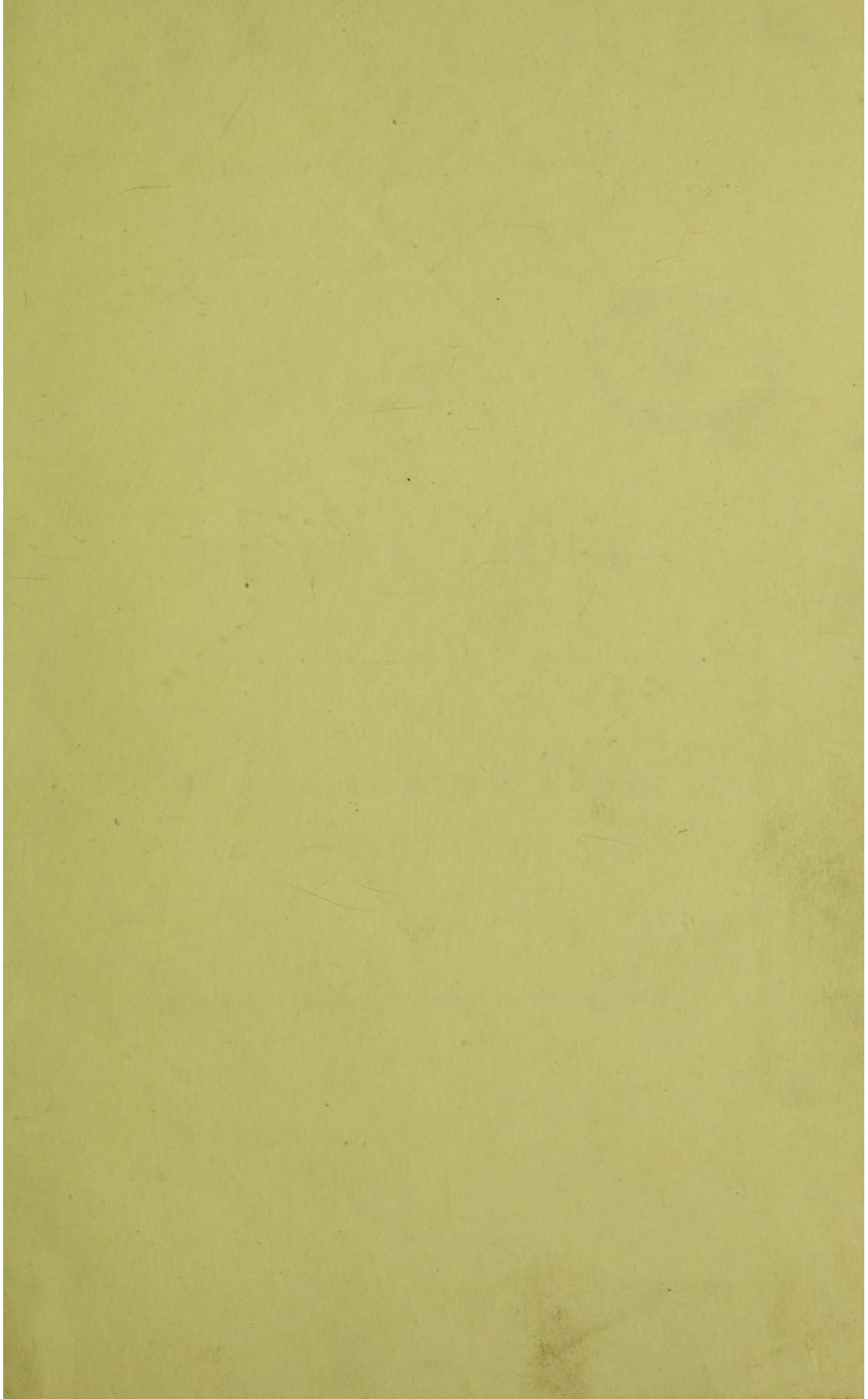
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ON THE

CEREALIA



OF

WESTERN AFRICA.

BY

W. F. DANIELL, M.D., F.R.G.S.,

ASSISTANT STAFF SURGEON, &c.

(From the PHARMACEUTICAL JOURNAL for February, 1852).

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## ON THE ZEA MAYS AND OTHER CEREALIA OF WESTERN AFRICA.

BY WILLIAM F. DANIELL, M.D., F.R.G.S.,  
Assistant Staff Surgeon, &c.

AMONG the vegetable products cultivated by the natives of the maritime countries of Western Africa, may be enumerated the maize or Indian corn, a plant which occupies no unimportant position in public estimation. Found more or less plentiful in most of the parts frequented by European merchants it is frequently included with other vegetable supplies furnished for the shipping, and sometimes exported in large quantities to other lands for a variety of purposes. It would appear, in the first instance, to have been reared more for the object of varying that constant uniformity of diet, peculiar to the social condition of the African races, than as a commodity for sale, unless on the Gold Coast and the Bight of Benin, where its growth is zealously fostered, and its value more profoundly appreciated from the fact that nearly four-fifths of the people are often dependent on its production for their daily sustenance. Rendered, therefore, subservient to the wants of the inhabitants by different modes of dressing, and other culinary processes, it has deservedly gained their grateful estimation, both for nutritious properties, and the prolific harvests annually afforded, which have had the effect of imperceptibly superseding most of the farinaceous food of ancient usance. Distinguished by these evidences of popular favour, established on the basis of its paramount utility, a few remarks connected with its history and appliances may not be destitute of interest.

Like the cocoa-nut, orange, and pine-apple, it is not indigenous to the African coasts, but owes its introduction to the Spanish and Portuguese voyagers, who, in the sixteenth century, carried on an extensive traffic with the West Indies and their South American colonies. Since that date it has become naturalized in almost every known district of intertropical Africa, and has passed from thence to the remoter regions of the interior. The fetishmen and other trustworthy authorities, on whom reliance can be placed with reference to their aboriginal customs, concur in stating, that prior to the visits of the white traders it was unknown to their immediate ancestors. Ample illustrations might be adduced to corroborate the truth of these assertions, even from a casual investigation into the character of some of their fetish rites, in the consummation of which they specially retain the native cerealia, while the zea and other vegetables, originally of foreign derivation, are as stringently prohibited.

Barbot informs us that the maize was first brought to the Gold Coast by the Portuguese, from the island of St. Thomas, in the Bight of Biafera, where it was designated by the term *milho grande*, in contradistinction to the smaller seeds of the *Penicillaria spicata*, abundantly grown on the continent, and named by them *milho pequeno*. Shortly after its importation, the prominent superiority of this grain was soon manifest in many of the country farms, from the propitious nature of the soil and the continued fecundity and bountiful increase of their crops,



which rapidly led to its propagation throughout many of the circumjacent territories, where large cargoes were obtained, carried to the outports, and vended to the commercial factories and slave ships. During the time of peace, and in those days so cheaply could this produce be purchased, that a thousand stalks might be procured without difficulty for the moderate sum of five shillings, and in other places at a third or fourth part less. Since then it has thriven remarkably well and without a single drawback.

Undoubted proofs have remained to attest that the maize was indigenous to both continents of America, and was sown in considerable quantities by the Aztecs and ancient Peruvians, by a systematic husbandry, long in vogue before the Spanish conquests, and converted then as now into a number of useful conveniences, that formed in fact the staple support of their redundant populations. The origin of the word *mays* has been ascribed to the Carribean appellation *mahiz*, an aboriginal expression, which has doubtless been transferred from one of this group of islands. Several of the Spanish historians and naturalists have bestowed great labour and research on the natural history of the new world, particularly Hernandez, who has compiled an elaborate memoir on the vegetable products employed as food by the native races at and briefly after the epoch of their subjugation. The most valuable to which he refers is this corn prepared into a diversity of bread stuffs in multiform compounds, some of which are said to be identical with those in common use among the modern Mexicans, and denominated in Indian parlance *tortillas* and *atolles*. The flour of the former, before its conversion into these well-known cakes, is slightly flavoured with limes and a tinge of pepper, with these the primitive tribes also incorporated various medicinal herbs, they, as perhaps the Chilis, being probably intended to avert the bad effects of that constipating influence, thought to result from its general prevalence, and of which the negro races of Guinea are fully cognizant. The *atolles* were smaller cakes moulded from the admixture of a finer meal with water, and sweetened formerly by a pleasant flavoured sugar extracted from the stalks of the same plant, but now by the juice of the sugarcane, or which is perhaps preferable, with delicious honey from the *tierra caliente*. From the numerous varieties of the maize ascertained to exist in every inhabited region of the American continent, a selection was made of the finest by the aboriginal Peruvians for their religious festivals and sacrifices, the best of which they called *canem*, to separate it from another termed *canta*, that served for their ordinary bread.

It would be superfluous at present to enter into the botanical details of a plant so celebrated in every quarter of the globe, an abbreviated description being all that is deemed requisite.

**ZEA MAYS:** Linn., *Maize or Indian Corn*. Class Monœcia, Ord. Triandria, Nat. Ord. Gramineæ.—*Root* annual, of innumerable fibres. *Stem* erect, somewhat branched, round, stout, jointed, leafy, from five to ten feet high. *Leaves* entire, sheathing, lanceolate concave, acute ribbed, two or three feet long, and three or four inches broad. *Male* flowers in numerous aggregate terminal spikes, each three or four inches long, greyish, downy, with purple anthers. *Female* flowers below, in a generally simple cylindrical spike, covered by the large sheaths of the upper leaves. *Styles* six or eight inches long, very numerous, of a shining yellowish or reddish hue, hanging down like a long silken tassel. *Seeds* white, yellow, red, or purplish, forming a heavy tessellated, cone-like, naked spike, from six to ten inches long. Lin. *Sp. Plant.*, 1378.

The name in Faute is *Ebru*; in Akkrah, *Abblé*; Popo, *Birrie*, or *Abirrie*; Yorruba, *Agbahdo*; Bonny, *Beakpa*; Old Calabar, *Ebochoat*; Gaboon, *M'bah*; Kongo, *Massah*

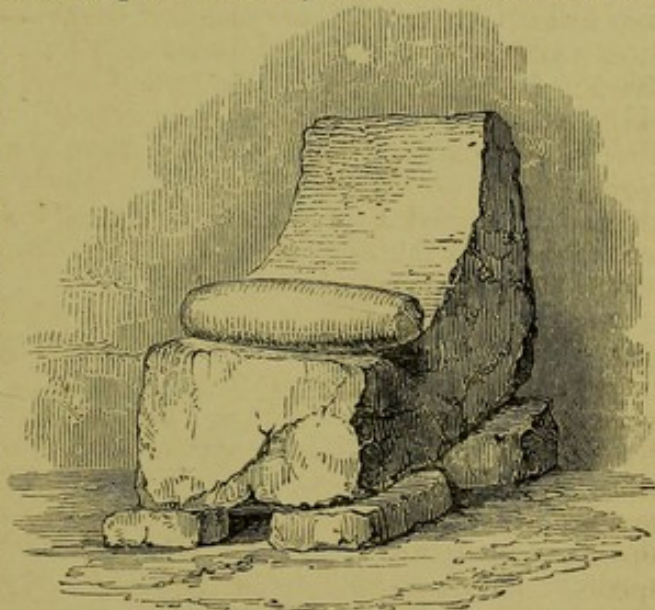
When cultivated the seeds are isolated in irregular rows, about a foot and a half apart, on some level space of land cleared with this view, and are deposited in the ground about the latter end of March or early in April, before the rainy season has set in, so that while it continues, the due amount of moisture may be provided to ensure the germination and subsequent progress of the tender

shoots. When arrived at the full maturity, the heads are cut off, and suspended to dry upon rafters within the native houses. The harvest commences about the first or second week in August; and the second harvest, from grain sown amid the rains, is concluded near the termination of October, and is extremely limited in quantity.

The mode of dressing and other economic processes devised by the people of Western Africa for the adaptation of this munificent cereal to their palates, seldom presents any conspicuous deviations, the same peculiar usages can almost be traced from the Arab to the Kaffir; the principal modifications being such as are perceptible in those countries where the culture of this plant is more decidedly encouraged, and by tribes who have somewhat emerged from the obscurity of savage life, and progressively advanced beyond the ruder arts of primitive barbarism.

In consequence of the diarrhœa and other gastro-enteritic irritations observed to occur from a protracted use in the raw state, it is rarely eaten uncooked; but the spike, after the divestment of its leafy sheath, is roasted on the embers of a slow fire, or is boiled with this covering entire; in this latter condition it may frequently be seen for sale in many of the local markets of the coast. The European residents in the colonies occasionally prepare, while yet immature, the tender grains as a substitute for the green pea, and this, when duly served with the needful accessories, is by no means a contemptible dish. The inhabitants of Ebo and Old Calabar also adapt it in a similar manner as one of the ingredients in their palm-oil soups, combined with smoked fish, prawns, and other esculent constituents. In Ashante, Popo, Dahomey, the Gold Coast, and several of the inland provinces of Yorruha, the grand alimentary preparations may be resolved into two—viz., the manufacture of a kind of bread called *kankié*, and a favourite beverage, whose reputation is pre-eminently diffused under the title of *pitto* or *peto*.

Kankiés are made after the following formula: The corn is first separated from the spike and thrown into a calabash of water, where it remains for a day. When sufficiently moistened it is taken out and ground between two stones, the inferior one being large, concave, and partly scooped out, and the upper long, convex, and tolerably cylindrical, so as to permit not only the grasp of the hand, but its adjustment into the concavity beneath. The first of these stones is placed in an oblique position, constituting an inclined plane before the worker, who is compelled to stoop when performing this labour. The



Kankie Stones.

crushing operation is repeated three or four times, or until the required quantity has been reduced into a coarse flour. The mass usually acquires a sourish taste before it is kneaded into dough, and is subsequently moulded into a number of loaves about the size of a man's fist, enwrapped in the leafy sheaths, and placed in a pot of boiling water for two hours or upwards. It is apportioned also into cakes the magnitude of the preceding, that are baked in clay or mud ovens, heated by fire, the apertures of which are closed by a cement, when the heating debris has been withdrawn. Women and girls are the only personages engaged in these domestic manipulations.

Pitto is manufactured by the succeeding method. The grain is cleared from the head, put into a proper-sized calabash, and moistened every morning by

fresh water, until the necessary approach to fermentation and sweetness has been induced. This period usually occupies from five to seven days, during which the malting is thoroughly effected by the corn being deposited in warm situations. It is next carefully dried, ground into a coarse meal, and thrown into a capacious pot of earthenware filled with water, and regularly boiled from twelve to twenty-four hours. The duration of this stage, however, varies in different localities, conformable to the customs of the people; as for example, in Popo, where the boiling is prolonged for two or three days, while in other places it is accomplished in almost as many hours. After the essential flavour and impregnation has been obtained, the fluid is strained from the dregs and poured into a number of jars, which are secluded in one of the inner compartments of the domicile, and gradually left to cool. They remain undisturbed from two to three days, or till that degree of fermentation supervenes, which best accords with their natural tastes. Occasionally a little salt is added, to facilitate the fermenting changes, and increase the potency of the intoxicating principle. In general it is of a muddy brown colour, and to Europeans has often a mawkish and somewhat insipid flatness, from the want of some bitter adjunct. When substantially brewed it becomes more agreeable and refreshing, resembling our table-beer, is highly extolled by the natives, and deemed more wholesome and nutritious than their customary potations of palm wine. The Peruvians and other American nations have also a sort of beer, made from the same grain by an analogous mode which they call *chicha de mayo* or *jora*. It is of a deep yellow tint, and is endowed with a sharp and slightly bitter taste.

II. ANDROPOGON, Linn.: *Sorghum Mich.*  
*Holcus Mieg.* *Brown Centrophorum, Trin.*  
*Guinea Corn, or Indian Millet.* — Spiculæ  
 geminæ, terminales ternæ; una completa  
 aristata; 1 vel 2 tabes-  
 centes steriles muticæ  
 (rarissime in spicula  
 tabescente glumæ aris-  
 tata); illa biflora,  
 flore inferiore, unipa-  
 leaceo, neutro, supe-  
 riore bipaleaceo, her-  
 maphrodito rarissime  
 femineo. Glume 2,  
 tardius indurato-co-  
 riaceæ muticæ. Paleæ  
 minores, hyalinæ; in-  
 ferior floris hermaph-  
 roditi longissime aris-  
 tata. Stamina 3.  
 Ovarium glabrum,  
 styli 2 terminales.  
 Stigmata plumosa;  
 pilis simplicibus den-  
 ticulatis. Squamulæ  
 2 truncatæ, plerum-  
 que, glabræ. Caryop-  
 sis glabra, paleis



Spikelet of its  
 natural size



Spike of the Guinea corn.

glumisque, involuta, libera. Rhachis spicata vel paniculata, sæpissimè articulata, spicæ solitariæ, conjugatæ, fasciculatæ, vel paniculatæ.

2 Rhachis paniculata (*Holcus Mieg. Brown*). *Sorghum Mich.* Class Polygamia. Ord. Monœcia. Nat. Ord. Gramineæ.

A. *Sorghum Brot. Lus.*, 188, *Humb. et Kunth, Nov. Gen.* 1, 190; *Roxb. Flo. Ind.* 1273. Nodis pubescentibus; vaginis foliisque glabris, margine serrulato scabris, panicula ramosa, coarctata; ramis pubescento pilosis, rhachi glabra; glumis hermaphroditis, neutrisque pubescentibus; pedicello piloso. *Kth. Holcus Sorghum*; *Linn. Sp. Plan.* 1484. *Sorghum vulgare, Pers. Syn.* 1, 101. *Host. Gram.* 4, t. 2. *Willd.* 4, 929. *Holcus durra, Forsk. Descrip.* 174. *Loc. Syn.*: Akkrah, Akkoko. Yorruba, Baba. Hausa, Dowah.

This cereal, indigenous to the Gold Coast and other circumjacent countries, is also to be abundantly found in that vast tract of land comprehended between the waters of the wandering Senegal and those of the distant Niger. Bountifully diffused throughout both Northern and Central Africa, and extensively raised as one of the principal articles of food for man and beast, it is varied into a manifold series of appliances by the populous communities spread over their more fertile and habitable regions. The genus embraces the well-known Durra,

(دور) of the Nubians and Egyptians, the قفولي ابيض or قفولي Ghafouly of the Desert tribes and darker races of Soudan, and the favourite Guinea corn of the West Indian negroes. Though much less common in the rivers of the Bight of Biafera and to the sea-girt lowlands that descend as far as the Kongo, even to the Portuguese territories more southward, its local distribution in these parts of the continent has hitherto escaped my recognition, though doubtless to be ascertained.\* Three or four kinds are to be observed, chiefly denoted by the form and colour of their seeds, varying from a pale straw tint to brown and dark red. Within the last two centuries its native employment, owing to the naturalization of the zea, has in a great measure been restricted, and its general adoption has been driven deeper inland, where the superiority of its rival is less appreciated or tolerated.

The learned Forskal has delineated four varieties of this corn grown in Egypt, Arabia, and the adjoining coasts. They are as follow:

1. *Holcus Durra*.—Panicula ovata; spiculis sessilibus, subvillosis; alternatim appendiculatis; flosculo uno, vel duobus vacuis sessilibus.

Var. *a.* Glumis viridibus; seminibus albis طم شيب سيدي *Taam schebb sæædi.*

β. Glumis fuscis; seminibus albis طم شعير ابيض *Taam scheer abiad.*

γ. Glumis fuscis; seminibus apice fulvis طم شعير احمر *Taam scheer ahmar.*

Kahiræ Durra in Arab. طم Colitur fere unicum cereale simul cum II. Dochna. Hoc est Arabum cereale vulgatissimum ex quo panis conficitur palato Europeo insipidus.

2. *Holcus Dochna*.—Panicula ramis, subternato, verticillatis, patentibus; rudimentis florum sessilibus, sub floribus fertilibus aristatis.

Semen magnitudinæ oryzæ; ovale, compressum, ferrugineum in calyce persistente, apice dehiscente retentum.

Rosetta primum mihi obveniebat in horto cultus ob pabulum avicularum florens initio Novemb. Postea cereale vulgare in Arabia inveniebatur. Arab.

دخن.

Buckhardt remarks that this kind is not grown in Egypt, but chiefly in Darfour, Sennaar, and on the coast of the Red Sea, from Djedda to Mocha, where it is valued as the main support of their inhabitants. The other botanical synonymes are *Andropogon saccharatus, Roxb. Flo. Ind.*, 1, 274. *Holcus Saccharatus, Linn., Sp.* 1484. *Wild, Sp.*, 4, 930. *Sorghum saccharatum, Pers. Syn.*, 1, 101.

\* An undescribed variety has been ascertained to grow on the upper banks of the river Kongo.

3. *Holcus exiguus*.—Paniculis coarctatis ramis alterius rudimentis florum pedicellatis, sub floribus fertilibus aristatis.

Differt ab. H. Dochna altitudine vix ulnæ; differt quoque paniculis coarctatis foliis linearibus; spiculis lanceolatis rudimentis florum, non sessilibus sed pedicellatis. Ad ripam Nili initio Novemb.

4. *Holcus racemosus*.—Spica cylindrica, spiculis ternatis pedicellatis, involucris setaceis longissimis. Ubique in Yemen. Prope accedit ad H. Dochna.\*

This product, like the maize, is converted to various useful purposes. By the people of Bornou and the Saharan oases, it is generally selected as the basis of that popular pudding or paste termed <sup>بزین</sup> *Bazeen*, in the absence of a

superior grain; and in the Gulf of Guinea and the Gold Coast is formed into a sort of coarse cake after its reduction into flour. The slave *Kafilàs*, on their transit from the Bir-el-abeed to the shores of the Mediterranean, prior to the commencement of their perilous travels through the inhospitable wilds and trackless paths of the desert, are mostly subsisted on supplies of this article, purchased with the intention of sustaining the strength of those enfeebled wayfarers who have to encounter these compulsory enterprizes. In tribes who have not attained any moderate degree of civilization, the corn is simply removed from the husk, cleansed in water, and then boiled, and in this condition is eaten either with meat or cured fish conjoined with other esculent adjuncts. The ficcory of Soudan is composed of the crushed seeds, mixed with water or milk, and seasoned with bird peppers, but in a short time is apt to degenerate into that degree of acidity which renders it disagreeable to European palates.

Appropriated also, after having undergone the preliminary mutations, to the brewage of a favourite beverage, lauded far and wide under the familiar designation of <sup>بوزة</sup> *Bouza*, for its virtues and generous qualities, it has acquired a celebrity in many respects justly merited. In Akim, Dahomey, Kreepe, and other adjacent territories, it is prepared almost in a similar manner as the pitto, and though often in that excellent state as to bear an advantageous comparison with our domestic ale, nevertheless is less sought for than the former.

Clapperton remarks, that in Nufé bouza is concocted from pulverized Guinea corn, honey, peppers, and the root of a coarse grass on which the cattle are fed. These are thrown into a large earthen pot, united with a certain proportion of water, and allowed to ferment near a slow fire for four or five days, when it is transferred to other jars, and is fit for imbibition after becoming very fiery and intoxicating. In Nubia and other kingdoms of Northern Africa, although this liquor is much better made from barley, according to Burckhardt, yet the durra is not unfrequently substituted for it. "Strongly leavened bread made from durra is broken into crumbs and mixed with water, and the mixture is kept for several hours over a slow fire. Being then removed, water is poured over it, and it is left for two nights to ferment. This liquor, according to its greater or smaller degree of fermentation, takes the names of merin, bouza, or om-belbel (او بلبل), the mother of nightingales, so-called because it makes the drunkards sing. The om-belbel has a pleasant prickly taste something like champagne turned sour."†

III. *PENICILLARIA SPICATA*, Swartz.—*African Millet*. Class Triandria Digynia: Nat. Ord., Gramineæ. This is another indigenous cereal, whose culture in former times was more zealously cherished on the Gold Coast and the inland provinces of Akim and Ashanté than at present. It may, however, still be noticed flourishing in the environs of Akkrah and other maritime districts as far as the Rio Formosa, and also in the Senegal and Gambia rivers, with other countries of central Africa, bordering on the course of the magnificent Kowarà, whose inhabitants, to a large extent, derive their ordinary

\* Flora Egyptiaco Arabica, p. 174.

† Travels in Nubia, p. 218.

support from the facility of its growth and copious fruition. From the traditional history of a few native tribes sufficient information may be gathered to warrant the remark that this grain constituted the most ancient kind of food, adopted by their primitive forefathers, and on this account was especially dedicated to the celebration of the more august feasts and religious ceremonies, the fetishmen and other sacerdotal authorities distinctly pointing out this curious circumstance to confirm the truth of their assertions, and to afford the best evidence of its consecration and descent from an immemorial source. At the grand harvest festival of the Akkrabs and Adampés, denominated Homowah, this millet is baked into delicate loaves, which are freely distributed by the priests to their families, relatives, and those opulent votaries who have expressed the sincerity of their devotions, by partaking of this sanctified production, as a gift vouchsafed by the beneficence of the supreme deity. It constitutes the *kouskous* of the Joloff's and Moorish nations, the *dra* and *bishna* of Tripoli, and the (قصب or قسب) gussub of the Sahara and Soudan. In Nubia it is designated هرنه *herneh*, and in Egypt as دخن.

As the knowledge we possess concerning this plant is rather circumscribed, the botanical outlines are now fully subjoined.

*Penicillaria*, Swartz.—Spiculæ solitariæ, vel geminæ, involucratæ, bifloræ; flores bipaleacei, inæquales; superior hermaphroditus, inferior brevior masculus interdum hermaphroditus, superiori similis. Involucrum, dimidiatum, multisetum persistens; setis inæqualibus, hispido-scabris. Glumæ 2-brevissimæ inæquales hyalino-membranaceæ. Hermaphr. Palea inferior herbacea concava; superior tenuior 4-nervia. Squamulæ nullæ. Stamina 3. Antheræ lobis terminalibus barbularis. Ovarium glabrum, ad basim styli interiorum cuspidatum. Stylus terminalis, elongatus. Stigma bifidum, plumosum; pilis hyalinis, simplicibus, papilloso-denticulatis. Caryopsis . . . Gramen erectum, ramosum, ramis farctis. Folia plana membranacea; nervo medio crasso, subtus prominente. Ligula brevissima, ciliata. Panicula simplex, oblongo-cylindræa; ramis simplicibus, sparsis vel subverticillatis, apice spiculas 1—2, gerentibus patentissimis rhachique pilosis.

*P. Spicata*, Willd. *Enum.* 1037. *Jacq. Eclog. Gram.* t. 17. *Beauv. Agrost.* 58, t. 13, f. 4. *Link. Hort.* 1, 221. Panicula subspicata, cylindræa, elliptica involucellis setaceis scabris; culmi geniculis villosis. *Willd. Holcus spicatus*, *Linn. Spec.* 1483. *Willd. Sp.* 4, 938. *Panicum spicatum*, *Roxb. Flor. Ind.* 1, 286. *Pennisetum typhoideum*. *Pers. Syn.* 1, 72, *Delile, Æg.* 17, t. 8, f. 3, *Cenchrus spicatus Cav. Prael. P. Plukenetii*. *Link. Hort.* 1, 221 (*Pluk. Alm.* t. 32, f. 4) *Pennisetum*



*Penicillaria Spicata*.

purpureum, *Thon. Brik.*, 64. f. 26. *Kunth Enum. Plan.* v. i., p. 165. *Loc. Syn. Akkrah. Mah. Nufé, Okkablebba Haussa Geeroh.*\*

On the Gold Coast, the purposes to which this grain has been applied, consist in its formation into a species of bread, resembling the kankie, after having previously been submitted to the action of the grinding stones, and reduced into a fine meal. It is mostly eaten by the upper ranks, or is confined in other localities to those sacred festivities above mentioned. At Bathurst in the Gambia, the Jolloffs, and neighbouring races, are devotedly attached to the preparation of what may be considered their favourite dish, one in constant demand, and dressed in the following manner:—

The seeds, with their husks, are well pounded in a deep wooden mortar, by one or two females, and their clearance effected from the latter, by repeatedly pouring the sifted portions from one calabash into another, at that height as would permit the wind or breath to disperse the lighter fragments. The grain, thus divested of the external sheath, is returned to the mortar, and beaten into a soft flour. Water is subsequently added, until the whole assumes the consistency of a dry paste, and the calabash containing the mass, continually shaken by a peculiar rotatory motion, by which the contents gradually resolve themselves into minute granular particles, closely analogous to those of sago.

In this state it is deposited in a large earthen cooking-pot, pierced beneath by a number of small apertures, through which the steam ascends, from a second appended below and filled with water. When the latter is heated the vapour escapes upwards, permeates, and efficiently softens the whole. In the water is often boiled a piece of salt pork, if obtainable, a fowl or two, and a few vegetables, but various kinds of fish, either fresh or cured, and duly seasoned with condiments, are more generally in vogue with the recommendation of being less expensive. This diet is that which is said to be swallowed in such immoderate quantities by the Moorish and negro women, to create that excessive *embonpoint* which enhances the price of their charms, and is deemed by them to be an essential attraction in their personal contour.

In Bornou, Major Denham states, that this millet, equally prevalent amongst people of all grades, and upon which animals are also fed, is named *gussub*, and is widely known. "It is produced in great quantities and with scarcely any trouble. The poorer people will eat it raw, or parched in the sun, and be satisfied without any other nourishment for several days together. Bruised and steeped in water it forms the travelling stock of all pilgrims and soldiers. When cleared of the husk, pounded, and made into a light paste, in which a little *meloheia* (*the eboo ochra* of Guinea) and melted fat is mixed, it forms a favourite dish, and is called *kaddell*." †

Independently of an inebriating liquor compounded by a process somewhat similar to that from the maize, another pleasant drink is made from *gussub*, prepared solely with this intent, which is much prized by travellers for its tonic and refrigerant properties, along the arid and sultry routes they have to pass. The cultivation of this and the Guinea corn takes place during the continuance of the rainy season, and differs slightly from the plan pursued with regard to the zea. A curious circumstance may be alluded to in connection with these products, viz., that in all the countries where they are grown, no sooner does

\* From the observations of Delile it would appear that the designation of *dochn* has been indiscriminately bestowed on different sorts of millet, as that of *durra* is on the Guinea and larger kinds of corn. Thus the zea mays is called *دور كيزان* *dourra kyzan* by the Egyptians, but if procured from Turkey or Syria is known as *D. Tourky* and *D. Shamy*. The general application of these terms, without reference to any particular grain, or the plant that furnishes them, renders the aboriginal nomenclature extremely perplexing to those unacquainted with their variations, which, moreover, is greatly increased by the orthographical vagueness in which they are sometimes written. For example, the word *durra* is written *dora*, *doura*, *do rah*, *dourra*, *dhourra*, &c. These remarks will equally apply to several other terms employed in this paper.

† Travels in Northern and Central Africa, p. 316.

the grain begin to ripen, than immense flocks of small birds congregate to prey upon them; and the natives, to avert the havoc that would otherwise result from their depredations, erect lofty stages in their fields, on which are stationed women and children to scare away the intruders, by their vociferous exclamations and outrageous gestures.

The various modes in which the flour or meal of the above mentioned cereals has been dressed in northern Africa, have already been enumerated by different travellers under the designations of Dweeda, Mogatta, Cuscousou, Atila, Zumeita, Bread Fetaat and Bazeen, or as the latter is called in Fezzan أسيد *aseedā*. Millet and barley are said to be the most popular productions in Tripoli and the circumjacent provinces.

IV. *PASPALUM EXILE*, *Sierra Leone Millet*. Class Triandria, Ord. Digynia, Nat. Ord. Gramineæ.—Within the last few years another kind of grain, chiefly confined to the districts in the neighbourhood of Sierra Leone, and ordinarily cultivated by the Soosu, Joloff, Bassa, and Foulah settlers, by whom it is termed “hungry rice,” has been fully described by Mr. R. Clarke, one of the assistant surgeons of that colony, under its native designation of *Fundi*, or *Fundungi*. It is sown in the months of May and June, the period when other varieties of corn are usually put in the ground, and like them, ripens in September, is subsequently cut down, collected into small sheaves, and placed in some dry spot within the native tenements. Mr. Kippist, to whom specimens of the grass were furnished, has regarded it as an undescribed species, although specimens were collected by Afzelius, and noted by him that it was much grown by the negroes of Sierra Leone. Mr. Kippist has distinguished it by the name of *Paspalum Exile*.

*Paspalum*, Linn.—Spiculæ bifloræ, cum pedicello articulata, tardius; deciduæ; flore inferiore, unipaleaceo, neutro membranaceo mutico; superiore bipaleaceo, hermaphrodito. Gluma 1 (rarissime 2, inferior minuta) superior (exterior), longitudine floris neutrius. Flos, hermaphroditus: Paleæ 2, coriaceæ, muticæ; inferior concava, superiorem binerviam amplectens. Stamina 3. Ovarium glabrum, styli 2 terminales liberi. Stigmata aspergilliformia; pilis subsimplicibus, denticulatis. Squamulæ 2 integræ, glabræ, carnosæ, truncatæ vel dolabriformes; ovario breviores. Caryopsis embryoni parallele compressiuscula, glabra, paleis induratis inclusa. Gramina plerumque tropica. Rhachis spicata, articulata. Spiculæ unilaterales. A *Panico* distinctum non nisi gluma inferiore plerumque abortiente. *Kth. Enum.* v. i., p. 40.

*Paspalum Exile*. Kippist Glaberrimum, caule filiformi, racemis subternis digitatis, axi partiali spiculis singulis angustiore, spiculis parvis sub-biserialibus pedicellatis, glumis ovatis acutiusculis paleis æqualibus, foliis lineari-lanceolatis margine serrulatis. Gramen sub-bipedale, inferne ramosum; racemi tenues, 3—4-pollicares, subsessiles; axes partiales angustissimæ, planæ, margine minutè denticulatæ; spiculæ vix lineales; glumæ exterioris respectu racheos (valvulæ floris masculi superstitis), nervi 7—9 æquidistantes, interioris 5, quorum laterales approximati; paleæ minutissimè striatæ; folia plana; vaginæ longissimæ; ligulæ truncatæ integræ. *Proc. Linn. Soc.*, p. 156-7, 1842.

Mr. Clarke states that the grain “is trodden out with the feet, and is then parched or dried in the sun to allow of the more easy removal of the chaff in the process of pounding, which is in wooden mortars. It is afterwards winnowed with a kind of cane fanner on mats. When prepared for use it is first thrown into boiling water, in which it is assiduously stirred for a few minutes. The water is then poured off, and the natives add to it palm oil, butter, or milk; but the Europeans and negroes connected with the colony stew it with fowl, fish, or mutton, adding a small piece of salt pork for the sake of flavour, and the dish thus prepared is stated to resemble kous-kous. The grain is also made into a pudding with the usual condiments, and eaten either hot or cold with milk; the Scotch residents sometimes dressing it as milk-porridge.”\*

\* *Proc. Linn. Soc.*, ubi sup.

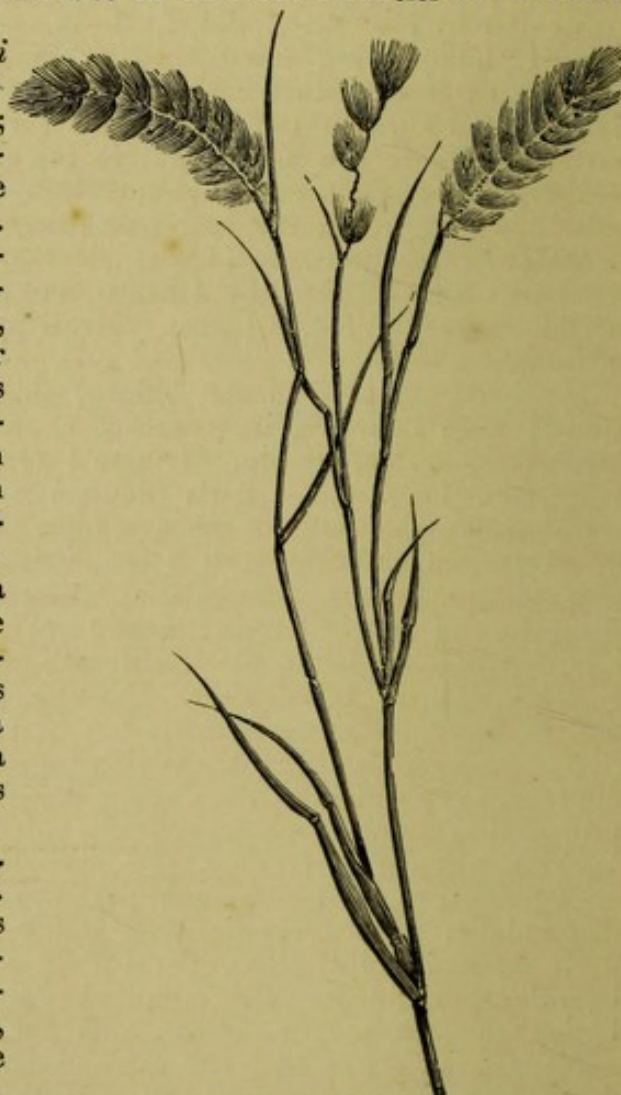


V. *Pennisetum Dichotomum*, *Delile*. Class Triandria, Ord. Monogynia, Nat. Ord. Gramineæ.—To the preceding cereals must be also appended this grass, which, applied to many useful purposes in Northern Africa, is as highly appreciated in other parts of the interior for the seeds it affords, and which form an article of food in great request amongst several of the native tribes. It is the same grass mentioned in Denham and Clapperton's travels, that gave so much trouble and annoyance to these travellers in their route from Agadem to Woodie, the whole surface of the country between these places being thickly covered for miles in every direction; it was deemed one of the greatest pests to both man and beast, from the prickles of the involucre being of a "fine and penetrating sharpness," and closely adhering to every substance they came in contact with. This plant abundantly grows in the deserts of Egypt and Arabia (where it is readily recognized by the country term of *تمم* *temam*, or *tummum*), in Bornou and Soudan, and also in different localities of Western Africa.

*Pennisetum*, *Beauv.* *Penniseti species*, *Rich.*—Spiculæ bifloræ, solitariæ, geminæ vel plures, involucratæ; flore superiore hermaphrodito; inferiore neutro vel masculo, rarissime fertili 1-2 paleaceo, membranaceo. Involucreum setosum, una cum spicula deciduum; setis interioribus inferne plumosis. Glumæ 2, inæquales, membranaceæ, concavæ; inferior rarissime abortiens. Paleæ floris hermaphroditi magis minusve coriaceæ, concavæ, inferior superiorem amplectens. Stamina 3. Ovarium glabrum; Styli 2 terminales, elongati, sæpe inferne connati. Stigmat-plumosa; pilis simplicibus. Squamulæ minutissimæ vel plerumque nullæ. Caryopsis embryoni parallele compressiuscula, glabra, paleis coriaceis inclusa libera. Gramina ramosa, facie Setariæ glaucæ. Folia plana. Spicæ cylindricæ, simplicis terminales rhachis non articulata.

*P. dichotomum.* *Delile* *Ægypt.* 15, t. 8, f. 1. (*v. s.*) *Link. Hort.* 1, 214. Culmo junceo, diffuso; foliis pagina superiore scabris; ramis erectis, subterno fasciculatis; spicis terminalibus, flavidis; rhachi aspera, glabra. *Delile.* Squamulæ certe nullæ. Ovarium oblongum, sessile, glabrum. Stylo duo terminales elongati, capillacei, glabri, liberi. Stigmata longitudine stylorum, plumosa; pilis simplicibus vix denticulatis. *Kunth. Enum. Plan., vol. i., p. 2, p. 116.*

*Panicum dichotomum.* *Forsk. Desc.* 20. *Phalaris setacea.* *Forsk. Desc.* 17 (*teste Delile*). *P. Phalaroides.* *Schult. Mant.* 2, 147. *Nees ab Esenb. in Mart. Bras.* 2, 283 (*teste syn. Forsk.*). Arabia. Egyptus. Willdenow *Phalaridem setaceam ad Panicum polystachyum, Linn. ducit. Kunth. Enum. Plan.* 1, 161. In Bornou, and other adjacent kingdoms, the seeds of this grass, known under the name of *kasheia*, are prepared for food, by being denuded of their husks, and dried in the sun, and well pounded or bruised, after which they are



*Pennisetum dichotomum.*

converted into a kind of bazeen, or eaten like rice. In consequence of the labour required in some of these dishes, and the difficulty that such obstacles offer to their popular use, they are esteemed as one of the luxuries of wealth and rank. Forskal states, that this plant constitutes the common fodder of camels and asses in Egypt and Arabia, and is likewise employed to thatch the native huts. The roofs and walls of these tenements being framed with slender sticks, bound transversely with others, are externally covered with tightly compressed bundles of the dried grass, frequently united with another, termed *بكار* *Bockar* (*Panicum turgidum*, Forsk.) to about the depth of a foot, firmly fixed by the aid of narrow ligatures. They are impervious to the rain, and usually last five or six years, after being finished internally with a whitewash of lime or gypsum.† The feathered tribes are also said to be extremely partial to this grain, which often serves them with an ample sustenance, in those desert regions, where but little vegetable food can be obtained.

VI. ORYZA, Linn.—*Common Rice*. Class Hexandria Digynia, Gramineæ Spiculæ unifloræ. Glumæ 2 parvæ membranaceæ, concaviusculæ, muticæ. Paleæ 2 chartaceo-coriaceæ compresso-carinatae, longitudine subæquales, clausæ inferior multo latior apice plerumque aristata: arista recta, basi subarticulata. Stamina 6. Ovarium glabrum. Styli 2 terminales. Stigmata plumosa; pilis ramosis. Squamulæ 2 glabræ, subcarnosæ. Caryopsis glabra oblonga, cotyledoni contrarie compresso-tetragona lævis paleis persistentibus clausis arcte obtecta, libera (paleis adnata teste Schreb.) Gramina exotica. Folia plana. Paniculæ ramosæ. Spiculæ pedicellatæ in ramulis racemosim dispositæ cum pedicello articulatae, compressæ, hispidæ. (*Kunth*).

*O. Sativa*, Linn Sp. 465. Willd. Sp. 2, 247 (*Catesb. Car.* 1, t. 14) *Lam. Encycl.* 5, 218. *Desv. Journ. de Bot.* 2, 76 *Nees ab Enseb. in Mart. Flor. Braz.* 2, 517. Foliis linearibus, elongatis, scabris, panicula racemosa, contracta, ramis infirmibus, scabris; glumis lineari-lanceolatis, muticis cordatove-aristatis. *Nees. Kunth. Enum. Plant. v. i., p. 7.*

This plant, so frequently found in almost every quarter of the globe, is also indigenous to several of the regions of Western Africa. In Egypt and other parts of Northern Africa it is named *ارز* *arz*, or *رز* *rouz*. On the Gold Coast it has excited but scanty attention, and apparently has never been much cultivated, unless in the neighbourhood of Appollonia and Axim, and the maritime districts located more westerly. It is likewise uncommon in the marshes and alluvial lowlands of the Gulf of Guinea, so favourably adapted for its growth, and is only observed in the interior countries of Haussa, Nufe, and Yorruba, where considerable quantities are annually reared for the native markets. In the vicinity of Rabbah and other Fellata towns near the confluence of the Tsadda, extensive tracts of land are constantly irrigated for its production, while the swampy expansions and fertilized banks of the Kowara and its tributary streams are rendered available for the same purposes. In these parts an abundant supply can mostly be procured, except in the kingdom of Bornou and the surrounding districts fringing the great desert, where the soil is unfavourable for its cultivation. The portions of tropical Africa, however, which yield the largest amount of this important grain, are the Kroo coasts, and those numerous rivers intersecting the country between them and the Senegal northwards, where it is so plentifully sown as to comprehend the chief article of food on which the inhabitants of many localities have to subsist. Converted by the Fantes into kankie-cakes, and the Mandingoes into a variety of tasteful preparations, it has so far enjoyed the reputation of being one of the most healthy and nutritious of all the farinaceous products devoured by the native races.

The effects produced on the physical development of the African nations from the constant use of the preceding aliments are worthy of consideration. There can be little doubt that communities so supported are endowed with a greater

† *Flora Egypt. Arab.*, c. 1. p. 20,

constitutional vigour and robustness than those that have been nurtured on yams, cassada, and other vegetable esculents; and, moreover, are better fitted to resist the enervating influences of labour and climate. Hygienic regulations, the result of an improved code of dietetics from higher social customs, have likewise contributed to favour this distinctive superiority, and hence a tendency to the assumption of certain adynamic types of disease is less manifested. But while this exemption, to some extent, takes place in populations whose physical amelioration partly proceeds from the sort of farinaceous food on which they are fed, conjoined with other endemic agencies, a predisposition naturally follows towards the induction of an opposite class of maladies, chiefly distinguished by the sthenic action they exert on the epidermal and mucous membranes of the body. This special prevalence may be remarked in many regions of tropical Africa, where the grossness and uniformity of diet has led to those disordered states of the chylo-poietic viscera, which promote the generation of such entozoa as are known to infest the internal cavities and parenchymatous structures.

On the Gold Coast the predominance of various species of intestinal worms, particularly the *lumbricus teres*, has frequently been observed, and though the *ascarides* are to be found in an almost equal ratio, they are much more prevalent amongst the inhabitants of the swampy lowlands, who live but indifferently and on substances of a poorer quality. It may, however, be considered somewhat questionable, whether these particular kinds of nutriment predispose the body to the germination of the *Filaria medinensis*, so extremely common to all grades of people on this coast; a probability rather feasible, but, unfortunately from the insufficient data we possess, cannot be satisfactorily verified. The effects more obviously proceeding from this addiction to such farinaceous edibles (rice being excepted) is that general torpor and constipation of the bowels to which the natives are so liable, and which they endeavour to avert, by introducing oleaginous soups and stimulating condiments into their dishes, or to remove by the daily employment of emollient enemata, from the frequency of whose requisition may be inferred the inefficiency of the former means. Apparently analogous irregularities of the intestinal canal may be traced to the same causes among the modern Peruvians, from similar varieties of food, they, according to Dr. Von Tschudi, being under the necessity of eating the fruit of the *Erythroxyton coca. Lam.* to obviate the inconveniences that proceed from these sources. He remarks in his interesting work, that the sustenance of "the Indians consists, almost exclusively, of vegetable substances, especially roasted maize and barley, converted into flour by crushing, which they eat without the admixture of any other substance. The continued use of this farinaceous food occasions severe obstructions, which the well known aperient qualities of the coca counteract, and many serious diseases are thereby prevented."‡ Among European residents in Africa, these native preparations of corn exert, at first, a purgative action, which, however, soon ceases, when the system has become more habituated to their effects.

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‡ Travels in Peru, p. 452.

