Notes on the Numeral System of the Yoruba Nation.

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really believed all he practised or had passed forward to the stage of unbelief. Mr. Gomme thought that he really believed in his own powers. Another feature prominently brought out by Mr. Howitt's paper, was the custom of repeating rhyming incantations. This was a subject that Mr. Gomme said he had paid considerable attention to and had made large collections of examples and it was curious how nearly everywhere much virtue was supposed to exist in the formulæ being in rhyme. Mr. Howitt's paper was particularly valuable because it was the personal observation of a traveller, and his notes would form a substantial addition to the already extensive literature of witchcraft.

Major E. CECIL JOHNSON, F.R.Hist.S., remarked that one of the most interesting points in the paper was the allusion to crystal as one of the substances supposed to be extracted by the "medicine men" or "wizards" from the bodies of their victims. Crystal had been associated from time immemorial in some mysterious way with the assumption of supernatural powers. We find it mentioned by medicinal writers in the black art as one important factor in the unholy rites of witchcraft. We find it credited with magical properties amongst the Jadoogars of India, we find it used by Cagliostro in recent times, and by modern mesmerists in electro-biological experiments.

Mr. RUDLER also made some remarks on the superstitions associated with rock crystal. Pieces of crystal are occasionally found in barrows, and seem to have been valued as amulets. He alluded also to the divining ball of Dr. Dee, which was a sphere of rock crystal now preserved in the Mineralogical gallery of the British Museum (Natural History).

The following paper was taken as read :—

NOTES *on the* NUMERAL SYSTEM *of the* YORUBA NATION.
By ADOLPHUS MANN, Esq.

OF late, the nations and languages of West Africa have largely occupied the attention of the learned linguists of Europe, and grammars and vocabularies are being published in considerable number. By means of the laborious work of Mr. Rob. N. Cust on "The Modern Languages of Africa," the classification of the four or five hundred languages has been advanced to such an extent as could not, some years ago, have been expected. Perhaps the following notes on the numeral system of the Yoruba nation may interest the student of ethnology and languages, and may be of some use in investigating the nature of the mind that can form such an unusual, yet regular structure. A superficial knowledge, with a slight attempt of praxis, suffices to understand peculiarities in the arrangement of these numerals, to which

analogies in other languages are but rarely found. We light, as it were, on a building, which, when viewed from base to summit is not behind our European systems in regularity and symmetry, while the system surpasses them in the aptitude of interlinking the separate members; it stands to them in the same relation as the profusely ornamented Moorish style stands to the more sober Byzantine.

The numerals of all nations are formed on the basis of the radical units, with one or two original terms, by the help of addition and multiplication we get all we want. One added to ten, and hundred and thousand properly joined together make up a complete system. Very different is the framework of the Yoruba, it can boast of a greater number of radical names of numerals, and to a large extent makes use of subtraction, which, in the Aryan languages we find employed only in the Latin *unde* and *duode viginti*, &c., &c., and which could not find a place in its Romance sister-tongues, whilst only a few Greek authors paraphrase subtraction with the verb *δέω*, *opus habeo*, *indigeo*; as *δυοῖν δέοντες πενεήκονια ἄνδρες* or *μᾶσδεούσαις ἑκοσί ναυσίν*. Here subtraction is of a sporadic occurrence; in the Yoruba it enters so fully into the system as the third power with addition and multiplication to make up the file of numbers that we are tempted to ask, Where is division?

As it is not intended to write a paragraph of a grammar but rather an ethnological sketch, the language shall be introduced as little as possible, but it cannot be left out altogether; however, the structure can be understood by the arithmetical combination by which it is represented, and which in itself is very interesting. I shall give first the names of the units, and then the nouns serving as numerals, and beg to observe that I am using the alphabet employed in the literature the language has attained to.

1, *Eni* or *qkan*; 2, *eji*; 3, *eta*¹; 4, *erin*; 5, *arun*; 6, *efa*; 7, *eje*; 8, *ejọ*; 9, *esan*; 10, *ewa*; further 20 *ogun*; 30, *qgbqn*; 200, *igba*; 400 *irinwo* or *irino*; 2000 *egba*. *Eni* (1) enters only into the formation of *ekini* (the first): in other compositions *qkan* is used; the first syllable of these words is a prefix that can be thrown off, and enters into contraction when a vowel precedes. These words are radicals with the exception of *egba* 2000, which is a compound, but it does service as if it were a radical. It would be difficult to find out their meanings, the natives give none; the second syllable is in the form of the verb, but the first question would not be What is the meaning of the verbal word? but, Which of three roots is it? for we have three different tones on

¹ *e*=e in met; *q*=law.

the root of the same sound, *jà, jì, and j'í* low, middle, and high tone. Even if this point were settled, strong doubt would still fall on the connection between the meaning of the root in ages past and present. As cardinals, these words convey to the Yoruba ear and mind two meanings; first, the number and then the thing the Yorubas especially count, and this is money (shells) *Cypraea moneta*; *owo* in Yoruba, cowries in English. If the *first* syllable is emphasised, the meaning of the word is, 1, 2, 3, 4, &c., cowries, therefore on the question How many cowries? the answer is given in these radicals. Other objects are counted only in comparison with an equal number of cowries, for a nation without literature and without a school, knows nothing of abstract numbers. The ordinal numbers are formed as: *ek-ini* the first, *e* is prefix, *k* stands for *ka*, to count; but the numbers 20, 30, and all multiples of 10 do not take *ek*, but form the ordinal by placing the number after the object counted. The adjective numeral is formed by prefixing the number with *mu* (to take), but the *u* is always thrown out; *qkan* can not take *m* when alone, just so 20, 30, and all multiples of 10, but when a unit precedes 10, the unit takes the *m* as: *eniam ejilelogun* that means twenty-two persons: but *qgun enia* twenty persons; this *m* explains the *meji, mēta* in the polyglottas of Clarke and Koelle.

Proceeding now to the compositions, we meet the simplest form in 11, 12, 13, 14 = 1, 2, 3, 4, plus 10. Here it must be observed that the language has a great ability to reduce composite terms of numerals to short ones, *e.g.*, 1 plus 10 is in words *qkanleliewa* which turns out to be *qkanla*, &c. We shall find 10 *ewa* making an important figure as a long *a*.¹ Between 14 and 15 a break, as it were, takes place, 5 is never added to 10, but regularly subtracted from the following next higher tenth, and 4, 3, 2, 1, follow in its wake. We say therefore, 15, 16, 17, 18, 19 = 5, 4, 3, 2, 1, minus 20 and so on in every case of 5, 4, 3, 2, 1, before the next higher tenth, whilst 10, 20, 30 + 1, 2, 3, 4, are formed by addition; in both cases, addition and subtraction, the smaller sum is preceding the larger one. The word for addition is *le*, to be over, to be more: that for subtraction is *di* or *din* by dialectical difference, to lessen. Both verbs throw off the vowel when a vowel follows; if the smaller sum is placed after the larger one, it must be joined to it in a proper sentence with the verbal pronoun, it is more, *o le*, it is less, *o di*; the words for 1, 2, 3, 4, 5, are never shortened with the exception of 5, in 15 and 25 where *arun* 5 is replaced by *ẹ* (like *e* in *met*) thus *ẹdogun* for *arun dilogun*; by this rule we find that the numbers between every

¹ In the words 50, 70, 90 *ewadi* (10 from) turns *ad*.

tenth are formed of a line of addition and one of subtraction. We must now see how the tenths are built up. We proceed from 20. *Ogun* in composition *og* or *qg* sometimes even *q* as the first number that admits of multiplication; going on thus: $20 \times 2, 3, 4$, up to 20 times 9; but we must ask how are the numbers formed which are not even multiples of 10, such as 30, 50. Here, again, subtraction steps in. We have $50 = 20$ times 3 minus 10; $(20 \times 9) - 10 = 170$; 50 *adota* = *ewa diliogola* = $(20 \times 3) - 10$, $20 \times 5 = 100$; $(20 \times 6) - 10 = 110$, &c., but thirty has a word of its own, namely, *qghon*; of its etymology I could hear nothing. With $80 = 20 \times 4$ compare the French *quatre vingt*, the only instance of this form in the European languages.

With 185 we meet a new word, and with it a new factor of multiplication: it is *igba*, 200, for we say, $185 = (200 - 10) - 5$. 200 is a sum of money that owed its origin to the way in which cowries are counted and collected (swept) together (*gba* means to sweep, *gbale*, to sweep the floor, therefore *igba* is money that is swept together). Here we may explain the origin of this somewhat cumbersome system; it springs from the way in which the large sums of money (cowries) are counted. When a bagful is cast on the floor, the counting person sits or kneels down beside it, takes 5 and 5 cowries and counts silently, 1, 2, up to 20, thus 100 are counted off, this is repeated to get a second 100, these little heaps each of 100 cowries are united, and a next 200 is, when counted, swept together with the first. Such sums as originate from counting cowries are a sort of standard money, 20, 100 and then especially 200, and 400 is 4 little heaps each of 100 cowries, or 2 each of 200 cowries, representing to the Yorubas the denominations of the monetary values of their country as to us $\frac{1}{2}d.$, $1d.$, $3d.$, $6d.$, $1s.$, &c.: from the habit of counting 5 and 5 the fashion of subtracting may have taken rise, from the first lowest sum of uniting 5 and 5, that is $20 = 5 \times 4$ that of multiplying 20; the nature of the action, joining by a sweeping motion of the hands the 2 heaps of 200 each, suggested the new term *igba* and a number of such heaps lying about on the ground shows the fitness of multiplying 200 with smaller numbers as an easy way to rise to higher sums. Moreover, it must be borne in mind that in trade only sums which are multiples of 5, 10, 15, 20, &c., may reasonably be asked as fixed prices by which the reckoning is made up; sums lying between 5 and 10 are not to be thought of, negotiations of higher values *e.g.*, of 600 cowries are carried on upon the same principle, as, for instance, the seller will ask 1000 cowries, the buyer will propose 900, &c.: thus the inconvenience of cumbersome numerals is not felt in trade affairs, and when intermediate sums are to be named the expression in words always proceeds upon addition to or sub-

traction from the next standard sum, *e.g.*, $777 = (200 \times 4) - 23$. We should expect a regular progress from 200 onwards. However, the first multiple of 200 (400) is not formed upon this rule; it is *irinwo* or *irino*. Unable to find a derivation of the word, I suppose it is as much as *erin owo*; this cannot mean 4 cowries, but can carry an allusion to the 4 heaps of cowries which are counted, each having 20×5 , or to the 2 heaps of 200 each, either 4 heaps of 100 or 2 of 200 each being united, for 400 is in counting cowries a principal sum; 5 heaps of 400 make 2,000, or in English one head, the chief standard sum by which cowries are bought or sold against silver and gold. From 400 is derived 300; *irino di oggrun* becomes *odun*—300, a sum that, as the half more of 200, finds frequent application; compare 1s. 6d. The tenths between 200 and 400 and 500, &c., are framed by addition or subtraction $190 = 200 - 10$ and $210 = 200 + 10$: in the words of the language the smaller sum precedes the larger one, but the sound *o* (as in *law*) will not well afford a contraction with *le*=more, or *di*=less, therefore the composition with 300 (*odun*) would be 300 *o le* 10, &c., which sounds more fluent, *e.g.*, 355 would be framed thus: 300 *o le* $(20 \times 3) - 5$, but we would form 360 by subtracting 40 from 400, &c. In the same way the tenths beyond 400 are given by addition, $400 + 10$, $400 = 50$, but in 460 subtraction would be preferred, $500 - 40$, in words 40 from 500 *oji di ledgbeta*—40— $(100 - 200 \times 3)$. In the words for 500, 700, 900, 1,100, 1,300, 1,500, 1,700, 1,900, we have 100 deducted from the next higher multiple of $200 \times 3, 4, 5$, to 15. As in 15 and 25 *ed* stands for *arundilogun* and *arundilogbun*, so in each uneven multiple of 200, *ed* stands for 100 from 600, 800, 1000, 1200, &c. It is true the proper term would be *qd* = 100 from 600, 800, &c., (*oggrund*), but the strength of euphony of sounds is so overcoming that *e* is preferred on account of the following *e*, *e.g.* *edegbeta—oggrun di igba-eta*; with 200×10 we have reached the highest sum which is a factor for a further rise in numbers, *e.g.*, $200 \times 10 = egba$ 2000, from which the system forms $2000 \times 2 = 4000$ up to 20,000, but 3,000 and 5,000 are exceptions, because 15 and 25 give by multiplication with 200 fluent words, and the sums occur very often in trade: we have therefore $200 \times 15 = 3000$ and $200 \times 25 = 5000$; with 20,000 we have reached the highest compound number, 2000×10 *egbawa*, or commonly called a bag of cowries, *qke kan* (bag one) because this sum is a load which a man can carry on the head. It is plain the receptacle of the sum provides the name for it; at the same time it is an easy way to express high sums, *e.g.*, one bag = 20,000, 5 = 100,000, 50 bags = a million. We observe that *ed* is used for different values 5, 100, and 1000. 5 less 20, 5 less 30, 100 less 600, 800, 1000,

1,200, 1,400, 1,600, 2,000, and 1,000 less 8,000=7,000 &c.; *ed* serves as an arithmetical formula, the value of which must be found from the following factors in the compound numeral, thus, as above : 5 and 20, from 30, 100 from 600, 1,000 from 8,000.

MARCH 9TH, 1886.

JOHN EVANS, Esq., D.C.L., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

- From Dr. W. J. HOFFMAN.—A series of Chromolithograph portraits of Natives of Alaska. From water-colour sketches by W. J. HOFFMAN, M.D.
- From the CHIEF SIGNAL OFFICER, U.S. ARMY.—[At the request of 1st Lieut. P. Henry Ray.] Report of the International Polar Expedition to Point Barrow, Alaska.
- From the UNITED STATES GEOLOGICAL SURVEY. Bulletin, Nos. 7-14.
- From the COMPTROLLER OF THE CURRENCY, U.S.A.—Annual Report. 1885.
- From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE.—Archiv für Anthropologie. Band XVI, Heft 3.
- From the AUTHOR. Perak and the Malays. By Major Fred. McNair.
- Les Crânes dits déformés. By Juan Ignacio de Armas.
- Place et importance de la Craniologie Anthropologique. By Dr. L. Manouvrier.
- Die ältesten Spuren der Cultur in Mitteleuropa, mit besonderer Berücksichtigung Österreichs. By Prof. Dr. Johann N. Woldrich.
- Das Gräberfeld von Hallstatt. By A. B. Meyer.
- From the ACADEMY.—Atti della Reale Accademia dei Lincei. Vol. 11, Fas. 2, 3.
- From the ASSOCIATION.—The Journal of the Royal Historical and Archæological Association of Ireland. No. 63, July, 1885.
- Proceedings of the Geologists' Association. Vol. IX. No. 4.
- From the SOCIETY.—Journal of the Society of Arts. Nos. 1736, 1737.
- From the EDITOR.—Nature. Nos. 852, 853.
- Science. Nos. 158, 159.
- Revue d'Ethnographie. 1885. No. 6.