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ART. VIII.—*Etymology of the Turkish Numerals.* By S. W. KOELLE, Ph.D., Corresponding Member of the Royal Academy of Science in Berlin, and late Missionary of the Church Missionary Society in Constantinople.

THE Etymology of Numerals, or the question what primary ideas originally furnished the names for the different numbers, is a matter of considerable obscurity and uncertainty in many languages. Professor Bopp, in his *Comparative Grammar of the Sanscritic Languages*, translated into English by Lieutenant Eastwick, says, in vol. i. p. 427: “I do not think that any language whatever has produced special original words for the particular designation of such compacted and peculiar ideas as three, four, five, etc.; and as the appellations of numbers resist all comparison with the verbal bases, the pronominal bases remain the only means by which to explain them.” To whatever extent this may be true respecting the Sanscritic languages, it does not apply to many others spoken in Africa and America; and from these some light may possibly be derived for the elucidation of the former. Even in Asia there is the extensive stock of Tartar languages, to which also the Turkish or Osmanli belongs, where the roots of words occupy so dominant a position, and can, with their primary meaning, be still so easily traced, that in regard to them the very reverse holds good of what Professor Bopp affirmed about the absence of connexion with verbal bases in the Sanscritic Numerals. Only so much is true, that

also in the Tartar languages the Numerals were originally not designations for the abstract idea of numeric order, but expressions, still capable of being understood, to mark certain peculiarities of the fingers, with whose help people used to count. From being at first ordinary appellatives, they gradually passed into Numerals, or mere symbolic representations of numbers, when their primary signification faded away from the people's mind.

My attention was first drawn to the natural connexion between the numbers and the fingers, when, more than thirty years ago, I compiled the *Polyglotta Africana*, *i.e.* a comparative vocabulary of all the languages spoken in Sierra Leone by its motley population of liberated Africans. Many hundreds of natives from every part of the continent passed through my hands in preparing that work; and as the Numerals were amongst the words of my collection, I had ample opportunity of becoming acquainted with the African mode of numeration. One thing which I could not help noticing in their manner of counting was, that they generally made use of their fingers, and sometimes, from 11 to 20, even of their toes. In doing so, they also regularly with the fore-finger of their right hand first counted the fingers of their left hand, beginning from the little one and ending with the thumb; and then with the fore-finger of the left hand they, in the same order, counted the fingers of the right. Some of the men from whom I obtained the specimens of their language were so dependent on this dactylic aid, that they became bewildered when I requested them to count without using their fingers. A few of this class were so limited to the most rudimental attainments in mathematics, that they could only count up to five; and when I expressed my surprise as to how they could find this sufficient for the transactions of daily life, one of them replied, "We can manage very well: for having counted five, we put it aside on one heap and then begin another, and so on, as many as we may want."

The practice of calling in the help of fingers and toes for the purpose of counting, which I could still observe

amongst many African tribes, probably already existed in the remotest antiquity of the nations and languages of mankind, and was continued unchanged, with other primeval habits, by those children of nature in their secluded "dark continent" all these thousands of years. There can be little doubt that at that early period of the world's history, when the languages now spoken over the face of the earth were still in the process of primitive formation, that same practice universally prevailed amongst the tribes and nations not merely in Africa, but on every continent where man was found, and that the mathematical genius of our own ancestors was by no means elevated above it. For it is this antique and pristine habit of counting by the help of the fingers which constituted the natural foundation, and now forms the only satisfactory explanation of the fact that, in almost all the languages of mankind, the system of numeration reposes on either a *quinary*, or a *decimal*, or a *vigesimal* base, or one composed of two or all of these; that is to say, that people count either up to *five* (viz. the fingers of one hand), or to *ten* (viz. the fingers of both hands), or to *twenty* (viz. the fingers and toes), and then repeat or compound these highest with the preceding smaller numbers. Accordingly, all languages have distinct names for the Numerals up to five, and many up to ten. Those resting on a quinary base call six "five and one," seven "five and two," eight "five and three," nine "five and four"; but for ten they form again a distinct name. The numbers from 11 to 19 are compounds of ten with the units 1 to 9; and for twenty there is again a distinct word. Beyond twenty they compound in the same manner as beyond ten, and then assume either a decimal or a vigesimal character, according as they provide a new name for every decade or for every score. These three bases of numeration—five, ten, twenty—are so natural and do so readily, one might almost say, with a kind of physical necessity, suggest themselves to every man by the number of his fingers and toes, that it is really a matter of surprise they have not been unexceptionally and exclusively adopted. But though the Five and its multiples

almost universally prevail, there are also some few languages which build up their system of numeration on the basis of six, twelve, twenty-four. They are so few, compared with the others, as to appear only in the light of rare exceptions. Our word 'dozen,' as far as its use is concerned, seems to belong to a like category. What is the cause or natural foundation for this exceptional mode of numeration does not appear so plain: perhaps it proceeded from the still simpler principle of 'three' and may not be unconnected with a pronominal source, as suggested by Prof. Bopp. The occurrence of such a numeration being exceedingly rare and having even been questioned, it may not be superfluous to adduce an instance here. It belongs to the Bōla or Burāma language, spoken on the west coast of Africa between Senegambia and Sierra Leone, where they count thus: 1, *pulblo*; 2, *kétaw*; 3, *kóāyents*; 4, *kebākkr*; 5, *kányen*; 6, *pádši* or *pāi*; 7, *pádši na pulo*; 8, *bákirēi*; 9, *kahyéngalo*; 10, *inyēn*; 11, *dúkena*; 12, *ņgepádš ņgítm*. As here 'twelve' or *ņgepádš ņgítm* means evidently 'twice six,' so also 'twenty-four' or *ņgepádš ņkebākkr*, 'four times six,' and 'seven,' or *pádši na pulo*, 'six and one.' The base of numeration, therefore, is 'six,' instead of 'five.'

Having once, by ocular observation, my attention drawn to the intimate connexion of the quinary, decimal and vigesimal systems of numeration with the human fingers, or with the fingers and toes, it was natural to look to the same source also for light on the proper and original meaning of the several Numerals. Engaged with the study of the Vei language amongst the people who speak it about Cape Mount, my expectation on that point first began to be gratified. The Veiese count thus up to twenty: *dóndo*, *féra*, *ságba*, *nāni*, *sóru*; *súndóndo*, *súmféra*, *súnságba*, *súnnāni*, *tañ*; *tāndóndo*, *tāmféra*, *tānságba*, *tānnāni*, *tānsóru*; *tān súndóndo*, *tān súnságba*, *tān súnnāni*, *móbānde*. The etymology of at least three or four of these Numerals soon became clear to me. *Dóndo* is evidently a compound of *do* 'small:' 'small-small' or very small, smallest, as a designation of the *little* finger (of the left hand), the first in being counted.

The *n* of *dó-n-do* is an evolved consonant, which we have also in *férandeñ*, a twin, *lit.* a 'two-child,' from *fera* 'two' and *deñ* 'child.' The original meaning of *fera* must have been that of companionship, association, addition in general, and therefore it took its place in the language both as a Preposition 'with,' and as a Numeral 'two,' the latter being the first and therefore characteristic companion or addition of number one. *Tañ* 'ten' seems connected with *dána* 'to stay, stop; be at an end, be finished;' for after having counted the fingers, a stop naturally took place before proceeding with the toes; and *dañ* means 'to count.' *Móbánde* is a regular compound of *mō* 'man, person,' and *bánde* 'finished,' the usual participle passive of the Verb *bañ* 'to finish:' because with 'twenty' one person was finished, that is, all his fingers and toes were counted. *Mō féra bande* or 'forty,' means 'two persons finished,' etc. I was surprised that the Veiese had entirely lost sight of the original and manifest import of the word *móbánde*, and that in counting they used it merely as a symbol, like all the other Numerals; but as soon as I had called their attention to its proper etymology, they unhesitatingly fell in with it and affirmed its correctness. Strange to say, in the Greenlandish language the word for 'twenty' has the very same signification as in Vei, from which it may perhaps be inferred that the people who spoke it first lived in a milder climate, and had their naked toes more easily at their disposal for counting, than is now the case in Greenland. A striking confirmation of this finger-theory is also furnished by the Suto or Basuto language, where, as a friend lately informed me, the word for 'six' properly signifies 'jump over:' obviously because, in counting the number six, one 'jumps over' from the fingers of the left hand to those of the right.

When, with this knowledge of African numeration and Numerals, I afterwards came to Constantinople and my duties as a Missionary to the Turks rendered it incumbent on me thoroughly to acquaint myself with their language by exhausting etymological researches, I found the Turkish

Numerals no less transparent and no less easily reducible to their roots than Tartar words in general, and confirmatory, in a most remarkable manner, of my African theory about the primitive signification of numbers. The present treatise professing to set forth the etymology of all the Turkish Numerals, it will have to trace them to their source, and to point out the exact reasons from which the ancient Tartars, the ancestors of the present Turks, originally designated their numbers by the names which they still bear, and which at the first were not special words to express the abstract idea of numeric order, but general appellations relating to the fingers employed in counting, and only in the course of time turned into those purely symbolic terms which practically they now are.

The Turkish language has only twenty distinct and proper words to express numbers; and with their help all the other Numerals are represented. They are the names for the ten Units, the eight Tens, one for 'hundred' and one for 'thousand,' as given here:—1, بر (*bir*); 2, ایک (*eki*); 3, اوچ (*üç*); 4, دورت (*dört*); 5, بش (*beş*); 6, الٹی (*altı*); 7, یدى (*yedi*); 8, سکز (*sékiz*); 9, طوقوز (*tóquuz*); 10, اون (*ön*); 20, یکرمی (*yékirmi, yérmi*); 30, اوتوز (*ótuz*); 40, قیرق (*qırq*); 50, الی (*éli*); 60, التمش (*áltmiş*); 70, یتمش (*yétmiş*); 80, سکسان (*séksân*); 90, طوقسان (*tóqsân*); 100, یوز (*yüz*); 1000, بیگ (*biñ*).

(1) بر or بیر (*bir*), *one*. This number, according to the primitive mode of counting with the aid of the fingers, answers to the little finger of the left hand. As the Vei derived its name from the size of this finger (*viz. dondo*, 'small-small'), so the Turkish fixed upon its position, as *hithermost* in regard to the person who counts, and *foremost* respecting the fingers and numbers that are to follow. The word *Bir* therefore designates the number One, as that which is before, hitherwards, antecedent, in regard to all the other numbers. The same root has also settled in the language as the Noun and Preposition برو or بری (*bér-i*), signifying 'the hither side, this side; hitherward, since;' and as a Verb, *viz. ویرمک* (*vér-mek*), which in Tshagatai has still the

form **بیرماک** (*bir-mek*) 'to give, to present;' properly, 'to bring forward, to advance something for some one else.' In a more distant relationship to it stands **وارمق** (*vâr-maq*) 'to proceed, go forward to, reach,' in Tshagatai **بارماق** (*bâr-maq*) *id.* This Tartar root, with essentially the same meaning, is also widely spread in the Indo-European languages, where, however, its first consonant is sometimes aspirated, sometimes sharpened, *e.g.* Engl. fir-st, fore, before; fare; German Fir-ft, Fûr-ft; vor; fêran, fûhran; Latin præ, pro, per; primus; Greek  $\pi\rho\upsilon$ ,  $\pi\rho\omicron$ ,  $\pi\rho\omega\lambda$ ;  $\pi\rho\omega$ -τος  $\pi\acute{\epsilon}\rho\alpha$ ; Sanscr. **पुर्** (*pur*) præcedere, **पुरम्** (*pûr-am*) ante, coram, **पुरा** (*pûr-â*) antea, **पूर्व** (*pûr-va*) prior, etc.

(2) **ایکی** (*ék-i*), *two*. This is a Noun with a passive signification, regularly formed from the Verb **اکمک** (*ék-mek*), 'to sow (seed), to sprinkle (salt, etc.);' in Tshagatai **ایکماک** (*ík-mek*) 'to sow, to insert.' The sowing is a throwing or casting of the seed, and therefore the Noun *ék-i* signifies any thing thrown down or added to something else: an addition. Two being the first and, on this account, the characteristic addition to one, the second Numeral could consistently be represented by a word signifying *addition*, just as in Vei by one signifying companion, fellow. The succeeding additions, being no longer new and characteristic, could not in like manner supply names of a similar import for the following numbers. In Tshagatai another Noun is formed from the same Verb to designate the peculiar addition of what is, "thrown into the bargain," and also of a "patch," viz. **ایکلیک** (*ík-lik*). Other instances of Nouns formed like *ék-i*, by the mere addition of *i* to the root, are:— **چکی** (*ġék-i*) 'a horse-load,' from **چکمک** (*ġék-mek*) 'to draw, drag, carry;' **صاجی** (*sáġ-i*), 'small coins scattered at weddings,' from **صاجمق** (*sáġ-maq*), 'to scatter;' **یازی** (*yáz-i*) 'a writing, inscription,' from **یازمق** (*yáz-maq*), 'to write;' **یاری** (*yári*) 'a half,' from **یارمق** (*yâr-maq*), 'to split, to cleave.' The particular reason, which originally may have suggested the designation of the second Numeral as a mere addition or appendage to the first, was probably the characteristic peculiarity of the finger next to the little one of the

left hand, to which it corresponded in counting, and which is the weakest, most dependent of all our fingers, slavishly following its neighbour in all its movements, so that from this want of independence and character it has in several languages been called the "nameless" one.

(3) اۈچ (*üç*, Zenker in his Dictionary adds, vulg. *yüç*) *three*. The third Numeral corresponds to the third or middle finger of the left hand which *rises* or *tops* above all the rest; and from the surpassing *height* of this middle finger the third Numeral has derived its appellation. اۈچ (*üç*) 'three,' and اۈچ (*uç*) 'end, point, top, farthest limit, utmost or upmost end,' are one and the same root, and were originally identical. Under the influence of the soft vowels of the second and fourth Numerals the *u* of the third naturally soon softened into *ü*. The change of harsh into soft vowels is something very common in the Tartar languages, and they are sometimes interchanged by the people of the same country; e.g. Vambéry in his *Tshagatai* vocabulary writes اۈچماق 'to fly up' with *u*, اۈچماک 'to go out, extinguish,' with *ö*; but Shaw, in his *Specimens* from Eastern Turkestan, writes the former *öch-maq* and the latter *uch-mak*; again Vambéry writes اۈچ 'revenge' both with *u* and *ü*, Shaw with *u* only and Zenker with *ö* only. The latter has the vowel *ü* in اۈچ 'three,' but *u* in اۈچاۈ 'the three,' and in اۈچاۈلا 'all the three.' The ordinary Dictionaries give the vowel *u* to the Verb اۈچمق 'to fly up, to rise high;' but *ü* and rarely *u* to the Adjective اۈچه or اۈچه 'high,' which comes from the same root. The third Numeral, instead of connecting itself with اۈچ might also have attached itself to اۈچ (*iç*) 'inside, middle;' for as the third finger is the highest, so it also occupies an interior or intermedial position amongst the other fingers, having two on either side, wherefore in many languages it is called "the middle finger." But in Turkish اۈچ (*üç*) 'three,' can hardly be derived from اۈچ (*iç*) 'inside,' because *i* does not easily pass into *ü*. Nevertheless there is an etymological relationship of a different kind between اۈچ (*uç*, *üç*) and اۈچ (*iç*); they respectively express the



opposite but correlative notions of *out* and *in*, *high* and *deep*, and are held together, as it were, by the band of the neutral  $\text{اچ}$  (*āç*), which, in the Verb  $\text{اچمق}$  (*āç-maq*) 'to open,' denotes an activity for affording both egress and ingress, according to circumstances. Professor Bopp, on p. 427 of the work already quoted, makes a remark containing both truth and error, which deserves to be noticed here. It is to this effect: "Only in *three* might one perhaps think of the Sanscrit base  $\text{त्रि}$  (*tri*) 'to pass over,' and consider three as the *more* than two. This verbal notion of passing over, adding, is, however, also the only possible one which could be blended with the names of numbers." Had Prof. Bopp paid attention to the correspondence between the Numerals and the fingers, he would have expressed himself differently. It is a remarkable confirmation of the theory I am illustrating that, in spite of his preconceived notions, he has to connect the Numeral *three* with the Sanscrit Verb  $\text{त्रि}$  (*tri*) 'to surpass.' But he is quite wrong in supposing that the reason is because three is "more" than two. The idea of addition could only furnish the name for two, where it is new and characteristic, but not for any of the numbers following, which all equally exceed their predecessors. The reason why three is called the "surpassing" number in the Sanscritic languages and the "end" or "top" number in Turkish, is not because it numerically exceeds two, but because the finger which symbolizes 'it surpasses all his fellows in height.

(4)  $\text{دورت}$  or  $\text{درت}$  (*dört*) *four*. The Verb from which this Numeral is derived is still in common use, namely,  $\text{دورتمک}$  (*dör-t-mek*), in eastern Turkish, according to Shaw, still  $\text{تورتماک}$  (*tür-t-mak*, with *u*) 'to poke, push, stir up, rouse, drive away.' The fourth finger, *i.e.* the finger next to the thumb of the left hand, was therefore regarded as the one with which we stir up, rouse, awaken, incite, chase away; or perhaps also—seeing that the Noun  $\text{دورتی}$  (*dör-t-i*) signifies 'prick, point'—the one with which we point, show the direction: the "index," in Germ. *Zeigefinger*, as his brother on the right hand is still generally called. As

regards its form, دورتمک (*dör-t-mek*) is an enlarged root by the addition of *t*, which imparts a causative and sometimes an intensive force, and it corresponds to the eastern طورمق (*tür-yuz-maq*) 'to rouse, raise, stir up,' from تورمق (*tür-maq*) 'to stand up, to rise.' Of a similar formation is بورتتمک (*bür-t-mek*) or برتمک (*bér-t-mek*) 'to wrench, sprain, dislocate,' from بورمق (*bür-maq*) 'to turn; also: یونتمق (*yön-t-maq*) 'to cut or mend (a pen),' from یونمق (*yön-maq*) 'to cut or dress the sides (یون = یان) of timber.' All the simple roots which can thus be enlarged terminate in ر or ن or ل, and the single consonants by which this enlargement is effected are پ ت چ ج ق ک.

(5) بش (*beš*) *five*. There can be no doubt that بش 'five,' and باش (*bāš*) 'head,' were originally one and the same word, so that the number five was called the *head*-number, because it corresponded with the thumb of the left hand, which, when the hand is closed, rises above the other fingers as the head above the body. When once the word was regularly employed as a Numeral in counting, it was natural to change its pronunciation a little, so as to distinguish it from its usual form with its primary meaning. In all the Turkish dialects the thumb is still ordinarily called باش پارمق (*bāš pârmaq*), *i.e.* 'head-finger,' and in Arabic and Persian الفوقی (*el-fôqi*), *i.e.* 'the upper one.' According to A. Castren's Grammar, p. 17, the Koibals pronounce بش with the vowels *i* and *e*, and the Karagassians even with the diphthong *ei*.

(6) التی (*äl-t-i*) *six*. This means properly the "low" number, or the number "below," from the still current الت (*äl-t*) 'the under part, the space below; under, below.' No more striking proof can be required, of the agreement between the ancient Tartars and the Negroes of Africa, in their mode of using the fingers for the purpose of numeration, than the name of this Numeral. It could not have been better chosen, had it been specially invented with the view of illustrating our theory. For if Five, as answering to the thumb of the left hand, is called the *head* or *upper* number, what can be more natural, one might almost say

more compulsory, than to take the name for Six from the corresponding *low* position of the little finger of the right hand, or to call Six the *underling* of Captain Five? We may also observe, in regard to its etymological character, that the root الت (*al-t*) is parallel to دورت (*dör-t*): it is not a perfectly simple or primary, but an enlarged or developed root. Its naked form is ال (*āl*), as in the Verb المتق (*āl-maq*) ‘to take, to hold;’ so that it appears the ancient Tartars regarded the *under* part of a thing as “taking” or “holding” what was above it, just as we say a vessel “takes” or “holds” what has room in it.

(7) يدى (*yéd-i*), *seven*. As التى (*āl-t-i*) ‘six,’ can etymologically be only derived from الت (*al-t*) ‘under,’ and ايكى (*ék-i*) ‘two,’ from ايكمك (*ék-mek*) ‘to sow, to throw:’ so also يدى (*yéd-i*) ‘seven,’ can only be formed from يدمك (*yéd-mek*) ‘to lead a horse by the hand, to tow a vessel, to draw after, or cause to follow anything.’ Another Noun derived from this Verb is يدك (*yéd-ek*), which means ‘a led horse, a ship or boat in tow, the rope by which the horse is led or the ship towed.’ The appellation of the seventh Numeral is therefore a most correct and striking characteristic of the finger next to the little one on the right hand, which, with its brother on the left, is of all our fingers the weakest and least independent, submissively following its little neighbour in all its movements, like a led horse, or a ship in tow. As the Latin language calls the one *secundus*, from *sequi*, to follow, so the Sanscrit names the other सप्तन् (*sáptan*) from सप् (*sap*) *sequi*, and the Turkish يدى (*yéd-i*) from يدمك (*yéd-mek*) ‘to be led after, to follow behind.’ These are facts which show a close observation of nature and a truly remarkable agreement in the systems of numeration belonging to languages so widely different as the Arian and the Tartar, and yet strongly confirming our African finger-theory. In point of etymology it may be observed that يدمك (*yéd-mek*) ‘to lead a horse, to tow a vessel,’ seems to have been originally identical with يتمك (*yét-mek*), in eastern Turkish ييتماك (*yit-mek, yét-mek*) ‘to

reach, to suffice:’ for in meaning both Verbs are closely allied, the following of a led horse or a towed vessel being in effect, as it were, a continual effort to “reach” what precedes. Perhaps the eastern dialects do not yet make use of the forms *یدمک* (*yéd-mek*) and *یدک* (*yéd-ek*), as I do not find them in the usual eastern vocabularies, but in their stead only *ییتماک* (*yit-mek, yét-mek*) ‘to reach,’ *ییتاک* (*yét-ek*) ‘a led horse,’ and likewise *ییتی* or *یتی* (*yét-i*) ‘seven.’ But the seventh Numeral tells also in this latter form (*ییتی* *yét-i*) the same tale about its connexion with the seventh finger, as in the now usual form *یدی* (*yéd-i*). The Numeral *یدی* is the first of which the Tartar-Turkish Dictionary, printed in Stambul by a learned Ottoman of high position, attempts an explanation in these words: “Its original form was *یتدی* (*yét-di*), as designating the day by which the week had *reached* its completion, the Sabbath day.” This explanation is right in connecting the Numeral with the Verb *یدمک* or *یتمک* or *ییتماک* ‘to reach, to endeavour to reach by following:’ but as the ancient Tartars no doubt had counted many things before they counted the days of the week, they could hardly have remained without a name for “seven,” until the Sabbath day suggested it to them; and had the *last* day of the week provided a number with its name, we would naturally expect to meet also with *other* traces of a septenary character in the Tartar system of numeration, which is not the case. Therefore the latter part of this explanation cannot well be entertained.

(8) *سکر* (*sék-iz*), in eastern Turkish *سیکیز* (*sik-iz*) *eight*. This is properly an Adjective derived from the Verb *سکمک* (*sék-mek*) ‘to jump, spring, bound; to rebound, glance off, ricochet (like a projectile from a hard surface).’ Accordingly it describes the eighth or middle finger of the right hand as the rebounding or glancing-off finger, in reference to the almost universally prevalent practice of *snapping* with this finger, when it glances off from the thumb, like a projectile from a curved surface. Shaw’s vocabulary of eastern Turkish has *ساکیز* and *سکر* (*sák-iz*) for eight, and *سکراماک* (*sák-ramak*) for: ‘to jump close-footed, to hop.’ Bianchi in his

Turkish Dictionary gives us two words سکز (*sék-iz*); the first he calls Persian, and assigns to it the meaning "whip" and "woodman's axe," and the second is the Turkish Numeral. But they are unquestionably one and the same genuinely Turkish word, which in the first case designates the whip and the axe as rebounding in being used and in the second the middle finger as glancing off in snapping. The termination *iz* or *'z* occurs with a similar force also in the following words: ايكيز or ايكيز (*ék-iz*), *lit.* 'a two-ling,' *i.e.* 'a twin, twins,' from ايكى or اكى (*ék-i*) 'two' (as in *Vei fêrandeñ*, 'a two-child'); دنگيز or دنگيز (*dên-iz*) 'the sea,' *lit.* 'the still, quiet, the pacific,' from دنگمك or دنگمك (*dîñ-mek*) 'to be still, quiet, calm;' because the sea stands still and does not 'go,' like the ايرمق (*ir-maq*) or 'river;' تيتيز or تيتيز (*tit-iz*) 'peevish, cross,' from دتمك (*dit-mek*), or eastern تيممك (*tit-mek*) 'to rend, tear in little pieces, to cast up wool as in carding it.' The Tartar-Turkish Dictionary already referred to seeks to explain the etymological origin of the eighth Numeral, by calling it "the number which *jumps* beyond seven." But if this kind of jumping had occasioned the name, it could with equal propriety have been conferred upon any other numeral except one; for every number in this sense jumps, as it were, beyond that which precedes it. Our own explanation is therefore the only one which meets the case.

(9) طقوز or طقوز, or in eastern Turkish توقوز (*tôq-uz*) *nine*. The formation of this and the preceding Numeral are the same in principle; for the difference in the formative syllable *iz* and *uz* is purely phonetic, the soft root *sék* requiring *iz* and the hard root *toq* demanding *uz*. As the name for eight is derived from a peculiarity of the middle finger of the right hand as the "snapping" one, so the appellation for nine is taken from a quality of the index-finger of the same hand, as the "touch"-finger. If this finger is in some languages justly called the "index" or *Zeigefinger*, it is in others with no less propriety also termed the "touching" or "feeling" finger; for most people, when they wish carefully to examine anything by their sense of touch, make

use almost involuntarily of the finger next to their right thumb. Accordingly the ninth Numeral derives its name from the Verb طوقنمق or طوقنمق (*tôq-un-maq*) 'to touch, examine by the sense of feeling;' which is itself derived from طوقومتق (*tôq-u-maq*) 'to weave, strike yarn together;' and this again from توقماتق (*tôq-maq*, Tshagatai) 'to put together, attach,' with which the form of the Turkish noun طوقمق (*tôq-maq*) 'a mallet, hammer, knocker,' coincides. The Tartar-Turkish Dictionary is again right in connecting this Numeral with its verbal base, but as unlucky as before in the reason it assigns, saying: "طوقوز or طقوز (*tôq-uz*) is the number so near to *ten* as to 'touch' it." But Nine does not touch Ten more closely than it does Eight, and all the other numbers equally "touch" their upper and their lower neighbour, and would thus be no less entitled to the appellation of "touch-number"; therefore the reason assigned does not account for the selection of the name exactly in this case. In the three Numerals whose etymological elucidation has been attempted by the distinguished and learned author of the Tartar-Turkish Dictionary, he succeeded as regards their outward form; but not possessing the right key to the enigma, it is no discredit to him that he failed in solving the difficulty altogether.

(10) اون (*ôn*), in Yakutic يون (*yôn*) *ten*. This root is identical with that of the Verb اونمق (*ôn-maq*), which Meninski renders by: *findere, expectare*; and Bianchi by: *fendre, attendre*; or with يونمق (*yôn-maq*) which means 'to split (wood), to cut or dress (the sides of) timber or stone.' From the latter comes the Noun يونغه (*yôn-ğa*) or يونقا (*yôn-qa*), and يوننتى (*yôn-un-ti*) 'splinter, shavings and other offal in dressing timber.' In Tshagatai Vambéry gives the meaning of اون (*ôn*) by: 'the right hand, the toes, ten;' and that of the cognate اونك (*ônk*) by: 'right, good; the right, justice.' Now the missing link for connecting all these different meanings is nothing else than the etymological base upon which all these words rest, namely, the Noun يون (*yôn*) *i. q.* يان (*yân*) 'side.' The connexion between *side* and *ten* is not very distant. Having counted up to ten,

the end of the fingers had been reached, so that they had now to be left on one side, and the mind to turn in a new direction. In Turkish **یان ویرمک** (*yān vérmek*, *lit.* 'to give side') means: 'to stand aside, aloof, to withdraw from a thing.' In any language, to pass from the side of a thing, or to turn aside from it, can give the idea: 'to cease, stop, stay in having any more to do with it.' The tenth Numeral is therefore characterized by its name **اون** (*ōn*) or **یون** (*yōn*) as the first great *turning*-point (leaving one side and turning to another), the first necessary *stoppage*, *halt*, *stay*, the chief natural *waiting* place in the progress of numeration. What my African friend, who could only count five, told me, "When we have counted thus far, we put it on one side and begin afresh," was also done mentally and figuratively by the nations who developed the decimal system. In one continued effort, and as it were without taking breath, the creative genius of language had invented a new name for every successive number up to ten, when the aid from the fingers was exhausted, and thus naturally a pause set in, and the question presented itself how to proceed farther. Many Negro tribes, after having done with their fingers, called the toes into requisition; and if the same thing was done elsewhere, might it not explain the singular coincidence that in Tshagatai and in German the same word is used for *toe* and *ten*? At all events the number **اون** (*ōn*) marks a stop or end in one direction, and the turn for a new start in another. The former meaning was also seized upon and still more plainly expressed by the language of the Kagsaminians and Kanskois in Siberia, which, whilst agreeing with the Turkish in the other Numerals, has, according to Klaproth's *Asia Polyglotta*, p. 160, for the number "ten" the new word "*būd*," which plainly means "end," from **بوتماک** (*büt-mek*) 'to come to an end, to finish, terminate; to come out, germinate (plants).' Compare also **بیتیک** (*bít-ik*) and **بوتوک** (*bót-ük*) 'approaching the end, finishing,' and **بوتون** (*büt-ün*) or **بتون** (*bít-ün*) 'whole, complete, all.' The word **یون** (*yōn*) 'side,' as we see from the Verb **یونمق** (*yōn-maq*) or **اونمق** (*ōn-maq*) 'to split,' also suggests the

idea of separating the two sides or halves of a whole, of halving, dividing, severing, parting. This is another way which would likewise lead us to the notion of division, section, separated portion, as the meaning of the Turkish Numeral which completes the first decade. The division of a whole into two equal parts or halves, closely corresponding to each other, also naturally suggests that similar correspondence and agreement which subsists between merit and recompense, and constitutes the essence of justice, righteousness, right. Hence اونك (ōñ) 'just, right, good,' and اون (ōn) 'the right hand.' When we see in dictionaries that اوگمتق (ōñ-maq) means 'to heal, recover,' اوگلمق (ōñ-ul-maq) 'to be healed,' اوگلمز (ōñ-ul-maz) 'incurable,' اوگلدیجی (ōñ-ul-di-ji) 'remedy,' etc., we may feel tempted to regard the healing as a making whole, and to look upon the name of the tenth Numeral as signifying a numeric whole, a complete decade; but the meaning of اونك (ōñ) seems to forbid us from taking this view, and to represent to us the healing only as a restoration to a suitable, right and good condition. We may here also notice the material identity between the Turkish name for the first decade *On*, and the European name for the first unit in the Latin *un-us*, German *ein*; and the change of the former into *wonna* in the Tshawushian (see Kasem Beg's Grammar, p. 54), and of the latter into *wienas* in Lithuanian, *weens* in Lettish, and *one* (= *won*) in English,—a coincidence, which, if not of an etymological, is at any rate of a phonetic interest.

(20) يکرمی (*yek-irmi*, but usually contracted into *yirmi*) *twenty*. This Numeral is evidently a compound, of which the first part is يکی (*yek-i*) or ايکی (*ék-i*) 'two,' and the second ايرمی (*ir-im-i*, *ir'm-i*) 'its reaching,' so that the whole literally means 'two its reaching, or its twice reaching,' viz. 'to the end of ten, second arrival at a full decade,' or 'arrival at the end of two decades.' The Verb ايرمك (*ir-mek* or *ér-mek*), cognate with ايرمق (*ir-maq*) 'to go, to flow,' signifies 'to reach, to attain to, to arrive at a place;' and from it the verbal Noun ايرم (*ir-im*, *ir'm*) is regularly formed. In counting the ten fingers for the first time, a stop or limit had been come to, which was indicated by the



name of the tenth Numeral; and when they were counted over again (or in their stead the toes), a second halt was occasioned by this new arrival at the goal, and this was expressed in like manner by the name for *twenty*, the second decade.

The Turkish language has manifested an originality, a vigour and productiveness far above other languages with which it shares the decimal character of numeration. For whilst these contented themselves, in forming the names for the Tens, with simply repeating the Units in a peculiar form, or in conjunction with the name for Ten, the Turkish made a desperate effort to produce distinct appellations, expressive of an intelligible meaning, for the second, third, fourth and fifth decade, in their respective last number; and only after having well-nigh exhausted the possible, stooped to the method of other mortals, by employing the Units in the formation of the names for 60, 70, 80 and 90. Only the Karagassians, a Turkish tribe near the river Yenisei, seem not to have followed the general Turkish imagination in its vigorous flight, but to have preferred the even march with compounds of the Unit and Ten throughout. According to A. Castren's *Sprachlehre*, p. 17, their Tens are as follows: 20 *ihon*, from *ih* 'two,' and *ön* 'ten,' 30 *üğön*, 40 *törtön*, 50 *beşön*, 60 *alton*, 70 *yeton*, 80 *seheson*, 90 *tohoson*.

(30) اوتوز or اوتوز (*öt-uz*) *thirty*. The formation of this Numeral is similar to that of سكر (*sék-iz*) 'eight,' and of طقوز (*tôq-uz*) 'nine.' It is derived from the Verb اوطورمق or اوتورماق (*öt-ur-maq*) 'to sit, settle, rest, remain.' Therefore, when the ten fingers had been counted for the third time and the occasion was once more given for a pause or stop, the name for the thirtieth Numeral was taken from the idea of sitting down, resting, and thus the third decade became marked as a new "*set*." In Tshagatai the word for thirty is اولتوز (*öl-tuz*), and, as we would naturally expect, the Verb from which it is derived اولتورماق (*öl-tur-maq*) 'to sit, to remain.' Another instance of the same formation is قودوز (*qud-uz*) 'hydrophobia; mad, enraged, out of mind,

from *قودورمق* (*qud-ur-maq*) 'to get out of one's mind, to become mad or enraged.' It will have been noticed that in these formations the final *r* of the Verb is eliminated, and that the *z* of *uz* and *iz* takes its place. By the same process also *كوز* (*göz*) 'the eye' is derived from the Verb *كورمك* (*gör-mek*) 'to see.'

(40) *قيرق* or *قيرق* (*qir-q*) *forty*. The only Verb to which this Numeral can be referred is *قيرمق* or *قيرمق* (*qir-maq*) 'to break.' Another pause having been reached on the ten fingers being counted for the fourth time, and the previous one having been called a "sitting" or a "set," this new stop is with no less appropriateness designated as a "break." The termination *يقى* or *ق* (*iq* or '*q*'), or in soft roots *يكت* or *كت* (*ik* or '*k*'), is employed in forming past participles, or adjectives of a passive and sometimes of an intransitive character, which are also frequently used as substantives,<sup>1</sup> e.g. *يارق* (*yār-iq*) 'split, cracked; a split, a crack, a fissure,' from *يارمق* (*yār-maq*) 'to split, to cleave;'  
*ياتق* or *ياتق* (*yāt-iq*) 'lying, inclined, not standing erect; a large flask with narrow neck, a travelling bottle,' from *ياتمق* (*yāt-maq*) 'to lie, lie down, rest horizontally.' So likewise *قيريتق* or *قيرق* (*qir-iq* or *qir'q*) means 'broken, broken off; a fracture, a fragment;' and it became the name for forty, because in reaching that number, the act of numeration met with another "break," and the fourth decade constituted a new "fragment" or part, portion, of the numbers.

(50) *اللى* (*él-lî*), better *الى* or *ابلى* (*él-i*) *fifty*. What is now the usual orthography of this Numeral is plainly erroneous. As *ek-i* 'two,' is written *اكي* or *ايكى*, so also *él-i* 'fifty,' ought to be written *الى* or *ابلى*. Both these words are equally pronounced with only one consonant. The mistaken orthography may have been suggested to some by the desire graphically to distinguish this word from others, of which the pronunciation is different; and to others by a false etymology, deriving the Numeral from the Noun *ال* (*el*) 'hand,' instead of perceiving that both the

<sup>1</sup> Compare Journal of the Royal Asiatic Society, Vol. XIV. Part II. p. 148.

Numeral and the Noun have their common origin in a Verb. The Tartar-Turkish Dictionary is of the latter class. It makes another sporadic attempt at numeral etymology, the last, as far as I can see, by explaining *اللي* (*él-li*) as meaning 'a hand of tens,' probably in the stead of a quint of tens, because the hand has five fingers. Vambéry and Shaw also follow in this track, contrary to native pronunciation, the former by writing *ايلىك* (*él-lik*) and the latter *ايلىك* (*il-lik*) 'fifty,' adding the question in parenthesis: "Is this Numeral connected with *il-ik* 'hand'?" But what must at once raise a hesitation in the mind as to the correctness of this course, is the fact that this would be the only instance in the formation of Numerals by means of the termination *لك* (*lik*), shortened into *لى* (*li*); whereas the language in general shows a decided partiality for providing the forms of its Numerals in pairs, as *e.g.* *ált-i, yedi; sék-iz, tóq-uz; alt-miš, yedmiš; séks-án, tóqs-án*. Another such pair was the ancient *قىرىق* (*qır-ıq*) 'forty,' and *ايلىك* (*il-ik*) 'fifty.' Dr. A. Castren, in his *Koibal Grammar*, p. 17, writes it quite correctly with one *l*, *il-ik* and *il-ek*; and Mirza A. Kasem Beg, in his *Turkish Grammar*, p. 54, though following the now customary faulty spelling in Turkish, yet in his Latin transliteration gives the correct form *él-i*. The state of the Turkish language itself, as it is still preserved to us in its various eastern dialects, and the nature of its grammatical laws, leave no doubt that, whether we recognize in the present form of the name for fifty the primitive termination *يك* (*ik*) or *لك* (*lik*), the Verb to which alone it must be traced as its source is *ايلىك* or *المك* (*il-mek*), signifying 'to stretch out, stretch forth; to stretch to, attach, tack to; to tie, fasten, button; to close, to shut.' Vambéry gives its meaning in Tshagatai only by 'to close, shut, tie, fasten;' and that of its derivative *ايلىك* (*il-ik*) by 'closed, shut, tied, fastened.' Shaw, in his eastern vocabulary, also assigns to the latter the meaning of "hand" (either from being stretched out, or closed, shut), and "marrow" (from being closed in and shut up within the bone), to which Bianchi adds that of "buttonhole"

(because it, as it were, closes in and shuts up the button, in tying or fastening a dress). This same word is also undoubtedly the original form of the Numeral الی (*él-i*) which, in harmony with its four predecessors, expresses the idea that another counting of the ten fingers, the fifth decade, is "closed." Thus the Numerals 40 and 50 were formed in one way, by the self-same suffix, which in the former case assumed the form یق (*iq*), as attached to a hard root, and in the latter یك (*ik*), as attached to a soft root. Such terminations and suffixes change in course of time, or are dropped altogether. ایلک (*él-ik*), when it meant fifty, shortened its termination into ی (*i*), ایلی (*il-i, él-i*); and when it signified "hand," discarded it altogether ایل or ال (*il, el*). The instances are not rare in which now only ی (*i*) is left of the primitive suffix یك (*ik*), and the following are some of them: دیری or دری (*dir-i*), *i. q.* دیریک (*dir-ik*) and تیریک (*tir-ik*) 'living, alive;' چری (*çer-i*), 'militia-man, soldier,' *i. q.* چیریک (*çer-ik*) 'brave, dexterous;' ایتی (*it-i*), *i. q.* ایتیک (*it-ik*) 'sharp, pointed, quick, agile.'

(60 and 70) الشمس (*ált-miš*) *sixty*; یدمش (*yéd-miš*) *seventy*. With this couple of names, for the sixth and seventh Ten of numbers, the language has recourse to the correspondent Units. In fabricating new appellations for the end of decades and for the pauses occasioned thereby, the resources were practically exhausted when the first Ten had been called an "Aside," a leaving on one "side," so as to make a fresh start in a new direction; the second a "Twice arriving," viz. at the end of the ten fingers; the third a "Sitting down, set, rest;" the fourth a "Break," and the fifth a "Close." At this point and not before, the creative imagination of the pristine Turks turns for aid to the Units. But even now it does not yet condescend to the mode of other nations, by mechanically combining a Unit and a Ten, but makes another desperate attempt, before consenting to that last step. It ingeniously converts the sixth and seventh Units into Verbs, and gives them the characteristic of the past participle, by appending to them the syllable مش (*miš*). الشمس (*ált-miš*) and یدمش (*yéd-miš*)

mean respectively: 'having *sixed*,' 'having *sevened*,' that is, having performed for the sixth and seventh time the act of numeration within its natural compass, as indicated by the fingers of both hands. Thus once more a couple of Tens has been provided with intelligible names, and yet the bodily introduction of اون (*ön*) 'ten,' dexterously avoided.

(80 and 90) سڪسان (*sék-sân*) *eighty*; طقسان or طقسان (*tóqsân*) *ninety*. Now, in this last pair of Numerals, the creative ingenuity seems finally conquered; it can no longer avoid the long-deferred اون (*ön*). But there is yet one means left of covering the defeat, and the language would not be Turkish, if it did not avail itself of this last alternative. A *compromise* is formed between the Unit and the Ten, by which each has to yield something: the former has its final consonant changed, the latter its vowel, and thus the transaction issues into daylight under the disguise of a سڪسان (*séksân*) for سڪز اون (*sékiz ön*), and a طقسان (*tóqsân*) for طقوز اون (*tóquz ön*).

(100) يوز (*yüz*) *hundred*. This same word is also still used with the signification of 'face, surface, front, farther side, onward direction.' A Verb is formed from it يوزمك (*yüz-mek*) which means 'to swim (*i.e.* to float or move on the "surface"); to skin, to flay (*i.e.* to take off the "surface" or skin).' It is obvious, therefore, that يوز (*yüz*) was chosen as a name for "hundred," because this Numeral was considered as the *uppermost*, or as being upon the *face* and *surface* of all the rest. At the time this name was chosen, "hundred" was probably the highest number beyond which the Turks did not count; and بيك (*biñ*) 'a thousand,' may have been superadded at a later period. In analogy with the formation of كوز (*göz*) 'the eye,' from كورمك (*gör-mek*), 'to see;' of ايز (*iz*) 'track, trace,' from ايرمق (*ir-maq*), 'to go;' and of سميز (*sém-iz*) 'fat,' from سميرمك (*sém-ir-mek*), 'to grow fat;' the Verb from which يوز (*yüz*) was derived must have been يورمك (*yür-mek*). In the Osmanli dialect this Verb is no longer used, but has been superseded by يورمك (*yür-ü-mek*) 'to walk, go, travel;' in Shaw's vocabulary of the eastern Turkish, however, we still find

یورماک (yür-mek) 'to walk, to progress, to proceed' (e.g. *âtga minip yürmek* 'to proceed on horseback'). This Verb fully accounts for the meaning of یوز (yüz) 'face, hundred' as of something foremost, uppermost. By the same association of ideas the eastern Turkish مانکلی (mān-lai), signifying 'forehead,' comes from the Verb مانکماق (mān-maq) 'to walk, go, advance, progress, proceed.' This view of the connexion between 'hundred,' as the face- or front-number, and 'face,' and between face and the verbal notion of proceeding, advancing, fronting, is certainly much more natural and simple than another, which might likewise present itself to one's mind, and which might be attached to the meaning of the English word *gang* in e.g. "a gang of thieves," so that یوز (yüz) 'hundred,' from یوریمک (yür-i-mek) 'to walk, to go,' would be regarded as originally indicating indefinitely any great number, e.g. of warriors going together to battle, or of cattle going together to pasture, and as only gradually restricted in its use to the definite number "hundred." But though this is not altogether impossible, and I myself made the suggestion many years ago, the former view is preferable.

(1000) بیڭ or بیڭ (biñ) *thousand*. This last of Turkish Numerals undoubtedly comes from the Verb بنمک or بینمک (bin-mek) 'to mount, to ride,' because it surmounts all the other numbers and has them under it, like a rider his horse. In the Numeral the *n* of the Verb is changed into ñ from euphonic reasons, as is also the case in the Substantive بڭ or بنک (beñ), which was originally identical with the Numeral and signifies 'a spot, mole, freckle,' evidently because these things appear in the face or sit on the surface of the skin. In the eastern Turkish dialects the Numeral and the Substantive are still wholly identical in every respect, and need not be treated as two words, as is now done in the dictionaries, for they are really only one. This whole view acquires the strongest confirmation by a reference to the words under consideration in Mr. Shaw's eastern vocabulary, where it has only to be remembered that the initial *m* stands for the *b* of the west, and the three words are thus given: مینک (miñ) num. 'a thousand; مینک (miñ) subs. 'a beauty-spot,

a mole on the face;’ ميبھاك (*min-mak*) v.tr. ‘to mount a horse, to ride.’

The attempt has now been made, and for the first time successfully carried through, of tracing *all* the Turkish Numerals to their roots and primary signification. Prof. Bopp’s opinion, that not any language has produced original words for the designation of the peculiar ideas three, four, five, etc., has been fully confirmed, as far as the Turkish is concerned; for we have found that all the present Numerals had originally definite other meanings, and were afterwards only applied and adapted to represent numbers. But the other part of his assertion, that “the appellations of numbers resist all comparison with verbal bases,” has been triumphantly disproved, as wholly inconsistent with the Turkish. Whatever may be said about the obscurity of the Sanscritic and Shemitic Numerals, those of the Tartar languages are perfectly transparent, as to their etymology and original meaning. The key which I have brought from Africa to the solution of the difficulty did not fail us in a single instance. It has enabled us to cast a slight glance into the early laboratory of language, and to witness a little of the process by which an unfettered imagination called into existence new words, or used old ones with a new meaning, and thus opened the door for a difference of pronunciation and change of form. The success thus obtained, as regards the Turkish Numerals—a success which hardly admits of doubt, in even a single instance—may also prove helpful in other directions, where obscurity and uncertainty have not yet yielded to the assuring light of knowledge.