An Arabic dictionary: "al-Mujam al-wáfi" or, "adhunik arabi-bangla abhidhan" and the Onsager's solution - Second part

Anindya Kumar Biswas*

Department of Physics; North-Eastern Hill University, Mawkynroh-Umshing, Shillong-793022. (Dated: January 6, 2022)

Abstract

We continue to consult an Arabic dictionary: "al-Mujam al-wáfi" or, "adhunik arabi-bangla abhidhan" by Dr. M. Fazlur Rahman. Here we count all the words initiating with a letter, including plural, feminine gender and appearing in other letters' sections. We draw the natural logarithm of the number of words, normalised, starting with a letter vs the natural logarithm of the rank of the letter. We find that the words underlie a magnetisation curve. The magnetisation curve i.e. the graph of the reduced magnetisation vs the reduced temperature is the exact Onsager solution of the two dimensional Ising model in the absence of external magnetic field.

 $^{^{\}ast}$ anindya@nehu.ac.in

I. INTRODUCTION

In this article, we continue to study magnetic field pattern behind the rich Arabic language. We study an Arabic dictionary: "al-Mujam al-wáfi" or, "adhunik arabi-bangla abhidhan" by Dr. M. Fazlur Rahman, [1]. We have started considering magnetic field pattern in [2], in the languages we converse with. We have studied there, a set of natural languages, [2] and have found existence of a magnetisation curve under each language. We have termed this phenomenon as graphical law.

Then, we moved on to investigate into, [3], dictionaries of five disciplines of knowledge and found existence of a curve magnetisation under each discipline. This was followed by finding of the graphical law behind the bengali language, [4] and the basque language [5]. This was pursued by finding of the graphical law behind the Romanian language, [6], five more disciplines of knowledge, [7], Onsager core of Abor-Miri, Mising languages, [8], Onsager Core of Romanised Bengali language, [9], the graphical law behind the Little Oxford English Dictionary, [10], the Oxford Dictionary of Social Work and Social Care, [11], the Visayan-English Dictionary, [12], Garo to English School Dictionary, [13], Mursi-English-Amharic Dictionary, [14] and Names of Minor Planets, [15], A Dictionary of Tibetan and English, [16], Khasi English Dictionary, [17], Turkmen-English Dictionary, [18], Websters Universal Spanish-English Dictionary, [19], A Dictionary of Modern Italian, [20], Langenscheidt's German-English Dictionary, [21], Essential Dutch dictionary by G. Quist and D. Strik, [22], Swahili-English dictionary by C. W. Rechenbach, [23], Larousse Dictionnaire De Poche for the French, [24], the Onsager's solution behind the Arabic, [25], the graphical law behind Langenscheidt Taschenwörterbuch Deutsch-Englisch / Englisch-Deutsch, Völlige Neubearbeitung, [26], the graphical law behind the NTC's Hebrew and English Dictionary by Arie Comey and Naomi Tsur, [27], the graphical law behind the Oxford Dictionary Of Media and Communication, [28], the graphical law behind the Oxford Dictionary Of Mathematics, Penguin Dictionary Of Mathematics, [29], respectively.

We count all the words, [1], one by one from the beginning to the end, starting with different letters in this paper. We have left out the entries which appear starting with different letters in a section belonging to a particular letter in our previous paper, [25]. Here, we do that. Here we include also the plural and feminine gender words.

The planning of the paper is as follows. We give an introduction to the standard curves

of magnetisation of Ising model in the section II. In the section III, we describe the graphical law analysis of the arabic words of the Arabic-Bengali dictionary, [1]. Section IV is Acknowledgment. The last section is the Bibliography.

II. MAGNETISATION

A. Bragg-Williams approximation

Let us consider a coin. Let us toss it many times. Probability of getting head or, tale is half i.e. we will get head and tale equal number of times. If we attach value one to head, minus one to tale, the average value we obtain, after many tossing is zero. Instead let us consider a one-sided loaded coin, say on the head side. The probability of getting head is more than one half, getting tale is less than one-half. Average value, in this case, after many tossing we obtain is non-zero, the precise number depends on the loading. The loaded coin is like ferromagnet, the unloaded coin is like para magnet, at zero external magnetic field. Average value we obtain is like magnetisation, loading is like coupling among the spins of the ferromagnetic units. Outcome of single coin toss is random, but average value we get after long sequence of tossing is fixed. This is long-range order. But if we take a small sequence of tossing, say, three consecutive tossing, the average value we obtain is not fixed, can be anything. There is no short-range order.

Let us consider a row of spins, one can imagine them as spears which can be vertically up or, down. Assume there is a long-range order with probability to get a spin up is two third. That would mean when we consider a long sequence of spins, two third of those are with spin up. Moreover, assign with each up spin a value one and a down spin a value minus one. Then total spin we obtain is one third. This value is referred to as the value of longrange order parameter. Now consider a short-range order existing which is identical with the long-range order. That would mean if we pick up any three consecutive spins, two will be up, one down. Bragg-Williams approximation means short-range order is identical with long-range order, applied to a lattice of spins, in general. Row of spins is a lattice of one dimension.

Now let us imagine an arbitrary lattice, with each up spin assigned a value one and a down spin a value minus one, with an unspecified long-range order parameter defined as above by $L = \frac{1}{N} \Sigma_i \sigma_i$, where σ_i is i-th spin, N being total number of spins. L can vary from minus one to one. $N = N_+ + N_-$, where N_+ is the number of up spins, N_- is the number of down spins. $L = \frac{1}{N}(N_+ - N_-)$. As a result, $N_+ = \frac{N}{2}(1 + L)$ and $N_- = \frac{N}{2}(1 - L)$. Magnetisation or, net magnetic moment, M is $\mu \Sigma_i \sigma_i$ or, $\mu (N_+ - N_-)$ or, μNL , $M_{max} = \mu N$. $\frac{M}{M_{max}} = L$. $\frac{M}{M_{max}}$ is referred to as reduced magnetisation. Moreover, the Ising Hamiltonian,[30], for the lattice of spins, setting μ to one, is $-\epsilon \Sigma_{n.n} \sigma_i \sigma_j - H \Sigma_i \sigma_i$, where n.n refers to nearest neighbour pairs. The difference ΔE of energy if we flip an up spin to down spin is, [31], $2\epsilon\gamma\bar{\sigma} + 2H$, where γ is the number of nearest neighbours of a spin. According to Boltzmann principle, $\frac{N_-}{N_+}$ equals $exp(-\frac{\Delta E}{k_BT})$, [32]. In the Bragg-Williams approximation,[33], $\bar{\sigma} = L$, considered in the thermal average sense. Consequently,

$$ln\frac{1+L}{1-L} = 2\frac{\gamma\epsilon L+H}{k_B T} = 2\frac{L+\frac{H}{\gamma\epsilon}}{\frac{T}{\gamma\epsilon/k_B}} = 2\frac{L+c}{\frac{T}{T_c}}$$
(1)

where, $c = \frac{H}{\gamma \epsilon}$, $T_c = \gamma \epsilon / k_B$, [34]. $\frac{T}{T_c}$ is referred to as reduced temperature.

Plot of L vs $\frac{T}{T_c}$ or, reduced magentisation vs. reduced temperature is used as reference curve. In the presence of magnetic field, $c \neq 0$, the curve bulges outward. Bragg-Williams is a Mean Field approximation. This approximation holds when number of neighbours interacting with a site is very large, reducing the importance of local fluctuation or, local order, making the long-range order or, average degree of freedom as the only degree of freedom of the lattice. To have a feeling how this approximation leads to matching between experimental and Ising model prediction one can refer to FIG.12.12 of [31]. W. L. Bragg was a professor of Hans Bethe. Rudolf Peierls was a friend of Hans Bethe. At the suggestion of W. L. Bragg, Rudolf Peierls following Hans Bethe improved the approximation scheme, applying quasi-chemical method.

B. Bethe-peierls approximation in presence of four nearest neighbours, in absence of external magnetic field

In the approximation scheme which is improvement over the Bragg-Williams, [30], [31], [32], [33], [34], due to Bethe-Peierls, [35], reduced magnetisation varies with reduced temperature, for γ neighbours, in absence of external magnetic field, as

$$\frac{ln\frac{\gamma}{\gamma-2}}{ln\frac{factor-1}{factor\frac{\gamma-1}{\gamma}-factor^{\frac{1}{\gamma}}}} = \frac{T}{T_c}; factor = \frac{\frac{M}{M_{max}}+1}{1-\frac{M}{M_{max}}}.$$
(2)

BW	BW(c=0.01)	$BP(4,\beta H=0)$	reduced magnetisation
0	0	0	1
0.435	0.439	0.563	0.978
0.439	0.443	0.568	0.977
0.491	0.495	0.624	0.961
0.501	0.507	0.630	0.957
0.514	0.519	0.648	0.952
0.559	0.566	0.654	0.931
0.566	0.573	0.7	0.927
0.584	0.590	0.7	0.917
0.601	0.607	0.722	0.907
0.607	0.613	0.729	0.903
0.653	0.661	0.770	0.869
0.659	0.668	0.773	0.865
0.669	0.676	0.784	0.856
0.679	0.688	0.792	0.847
0.701	0.710	0.807	0.828
0.723	0.731	0.828	0.805
0.732	0.743	0.832	0.796
0.756	0.766	0.845	0.772
0.779	0.788	0.864	0.740
0.838	0.853	0.911	0.651
0.850	0.861	0.911	0.628
0.870	0.885	0.923	0.592
0.883	0.895	0.928	0.564
0.899	0.918		0.527
0.904	0.926	0.941	0.513
0.946	0.968	0.965	0.400
0.967	0.998	0.965	0.300
0.987		1	0.200
0.997		1	0.100
1	1	1	0

TABLE I. Reduced magnetisation vs reduced temperature data s for Bragg-Williams approximation, in absence of and in presence of magnetic field, $c = \frac{H}{\gamma \epsilon} = 0.01$, and Bethe-Peierls approximation in absence of magnetic field, for four nearest neighbours.

 $ln \frac{\gamma}{\gamma-2}$ for four nearest neighbours i.e. for $\gamma = 4$ is 0.693. For a snapshot of different kind of magnetisation curves for magnetic materials the reader is urged to give a google search "reduced magnetisation vs reduced temperature curve". In the following, we describe data s generated from the equation(1) and the equation(2) in the table, I, and curves of magnetisation plotted on the basis of those data s. BW stands for reduced temperature in Bragg-Williams approximation, calculated from the equation(1). BP(4) represents reduced temperature in the Bethe-Peierls approximation, for four nearest neighbours, computed from the equation(2). The data set is used to plot fig.1. Empty spaces in the table, I, mean corresponding point pairs were not used for plotting a line.



FIG. 1. Reduced magnetisation vs reduced temperature curves for Bragg-Williams approximation, in absence(dark) of and presence(inner in the top) of magnetic field, $c = \frac{H}{\gamma \epsilon} = 0.01$, and Bethe-Peierls approximation in absence of magnetic field, for four nearest neighbours (outer in the top).

C. Bethe-peierls approximation in presence of four nearest neighbours, in presence of external magnetic field

In the Bethe-Peierls approximation scheme, [35], reduced magnetisation varies with reduced temperature, for γ neighbours, in presence of external magnetic field, as

$$\frac{ln\frac{\gamma}{\gamma-2}}{ln\frac{factor-1}{e^{\frac{2\beta H}{\gamma}}factor^{\frac{\gamma-1}{\gamma}}-e^{-\frac{2\beta H}{\gamma}}factor^{\frac{1}{\gamma}}}} = \frac{T}{T_c}; factor = \frac{\frac{M}{M_{max}}+1}{1-\frac{M}{M_{max}}}.$$
(3)

Derivation of this formula Ala [35] is given in the appendix of [7]. $ln\frac{\gamma}{\gamma-2}$ for four nearest neighbours i.e. for $\gamma = 4$ is 0.693. For four neighbours,

$$\frac{0.693}{ln\frac{factor-1}{e^{\frac{2\beta H}{\gamma}}factor^{\frac{\gamma-1}{\gamma}}-e^{-\frac{2\beta H}{\gamma}}factor^{\frac{1}{\gamma}}}} = \frac{T}{T_c}; factor = \frac{\frac{M}{M_{max}}+1}{1-\frac{M}{M_{max}}}.$$
(4)

In the following, we describe data s in the table, II, generated from the equation(4) and curves of magnetisation plotted on the basis of those data s. BP(m=0.03) stands for reduced temperature in Bethe-Peierls approximation, for four nearest neighbours, in presence of a variable external magnetic field, H, such that $\beta H = 0.06$. calculated from the equation(4). BP(m=0.025) stands for reduced temperature in Bethe-Peierls approximation, for four nearest neighbours, in presence of a variable external magnetic field, H, such that $\beta H = 0.05$. calculated from the equation(4). BP(m=0.02) stands for reduced temperature in Bethe-Peierls approximation, for four nearest neighbours, in presence of a variable external magnetic field, H, such that $\beta H = 0.04$. calculated from the equation(4). BP(m=0.01) stands for reduced temperature in Bethe-Peierls approximation, for four nearest neighbours, in presence of a variable external magnetic field, H, such that $\beta H = 0.02$. calculated from the equation(4). BP(m=0.005) stands for reduced temperature in Bethe-Peierls approximation, for four nearest neighbours, in presence of a variable external magnetic field, H, such that $\beta H = 0.01$. calculated from the equation(4). The data set is used to plot fig.2. Similarly, we plot fig.3. Empty spaces in the table, II, mean corresponding point pairs were not used for plotting a line.

BP(m=0.03)	BP(m=0.025)	BP(m=0.02)	BP(m=0.01)	BP(m=0.005)	reduced magnetisation
0	0	0	0	0	1
0.583	0.580	0.577	0.572	0.569	0.978
0.587	0.584	0.581	0.575	0.572	0.977
0.647	0.643	0.639	0.632	0.628	0.961
0.657	0.653	0.649	0.641	0.637	0.957
0.671	0.667		0.654	0.650	0.952
	0.716			0.696	0.931
0.723	0.718	0.713	0.702	0.697	0.927
0.743	0.737	0.731	0.720	0.714	0.917
0.762	0.756	0.749	0.737	0.731	0.907
0.770	0.764	0.757	0.745	0.738	0.903
0.816	0.808	0.800	0.785	0.778	0.869
0.821	0.813	0.805	0.789	0.782	0.865
0.832	0.823	0.815	0.799	0.791	0.856
0.841	0.833	0.824	0.807	0.799	0.847
0.863	0.853	0.844	0.826	0.817	0.828
0.887	0.876	0.866	0.846	0.836	0.805
0.895	0.884	0.873	0.852	0.842	0.796
0.916	0.904	0.892	0.869	0.858	0.772
0.940	0.926	0.914	0.888	0.876	0.740
	0.929			0.877	0.735
	0.936			0.883	0.730
	0.944			0.889	0.720
	0.945				0.710
	0.955			0.897	0.700
	0.963			0.903	0.690
	0.973			0.910	0.680
				0.909	0.670
	0.993			0.925	0.650
		0.976	0.942		0.651
	1.00				0.640
		0.983	0.946	0.928	0.628
		1.00	0.963	0.943	0.592
			0.972	0.951	0.564
			0.990	0.967	0.527
				0.964	0.513
			1.00		0.500
				1.00	0.400
					0.300
					0.200
					0.100
					0

TABLE II. Bethe-Peierls approx. in presence of little external magnetic fields



FIG. 2. Reduced magnetisation vs reduced temperature curves for Bethe-Peierls approximation in presence of little external magnetic fields, for four nearest neighbours, with $\beta H = 2m$.



FIG. 3. Reduced magnetisation vs reduced temperature curves for Bethe-Peierls approximation in presence of little external magnetic fields, for four nearest neighbours, with $\beta H = 2m$.

D. Onsager solution

At a temperature T, below a certain temperature called phase transition temperature, T_c , for the two dimensional Ising model in absence of external magnetic field i.e. for H equal to zero, the exact, unapproximated, Onsager solution gives reduced magnetisation as a function of reduced temperature as, [36], [37], [38], [35],

$$\frac{M}{M_{max}} = \left[1 - (sinh\frac{0.8813736}{\frac{T}{T_c}})^{-4}\right]^{1/8}.$$

Graphically, the Onsager solution appears as in fig.4.



FIG. 4. Reduced magnetisation vs reduced temperature curves for exact solution of two dimensional Ising model, due to Onsager, in absence of external magnetic field

letter	alif	bā	tā	šā	jeem	hā	khā	dāl	zāl	rā	zāy	seen	sheen	sād
number	8947	2098	3851	359	1525	2224	1461	1169	365	1877	714	2009	1494	1120
splitting	7090 + 680 + 335 + 842	1914 + 184	3835+16	349 + 10	1498 + 27	2167 + 57	1422 + 39	1149 + 20	350 + 15	1842 + 35	708+6	1981 + 28	1473 + 21	1108 + 12
letter	dād	tā	zā	ain	ğain	fā	$q\bar{a}f$	kāf	lām	meem	noon	hā	wāw	yā
number	478	816	177	2454	1004	1535	1887	1302	1154	9038	2205	921	1276	290
splitting	470+8	812+4	175+2	2314 + 140	980 + 24	1453 + 82	1859 + 28	1275 + 27	1073 + 81	8948+90	2179+26	906 + 15	1256 + 20	276 + 14

TABLE III. Arabic entries: the first row represents letters of the Arabic alphabet in the serial order, the second row is the respective number of entries, the third row describes the splitting of entries.

III. ANALYSIS OF WORDS OF THE ARABIC-BENGALI DICTIONARY

The Arabic language alphabet is composed of twenty eight letters. We count all the words, [1], one by one from the beginning to the end, starting with different letters. We have left out the entries which appear starting with different letters in a section belonging to a particular letter in our previous paper, [25]. Here, we do that. Here we include also the plural and feminine gender words. The result is the table, III. To clarify, we have counted all entries initiating with Alif form the section for the letter Alif. The number is seven thousand ninety. Second, we have enlisted all entries initiating with Alif form the sections for the letters $B\bar{a}$, $T\bar{a}$,..., $Y\bar{a}$. Then we have removed from the list entries already appearing in the section belonging to Alif. Then we have counted the number of the entries in that list. The number is six hundred eighty plus three hundred thirty five plus eight hundred forty two. As a result total number of words beginning with Alif is eight thousand nine hundred and forty seven. This exercise was then followed for the letters $B\bar{a}$, $T\bar{a}$,..., $Y\bar{a}$. The result is the table, III.

To visualise the pattern of change of number of entries along the the letters initiating with, we draw the number of entries vs. sequence number of the respective letters in the fig.5. For the purpose of exploring graphical law, we assort the letters according to the number of words, in the descending order, denoted by f and the respective rank, denoted by k. Moreover, we attach a limiting rank, k_{lim} , and a limiting number of words. The limiting rank is maximum rank plus one, denoted as k_{lim} or, k_d . Here it is twenty nine and the limiting number of words is one. As a result, k is a positive integer starting from one and both $\frac{lnf}{lnf_{max}}$ and $\frac{lnk}{lnk_{lim}}$ varies from zero to one. Then we tabulate in the adjoining table, IV and plot $\frac{lnf}{lnf_{max}}$ against $\frac{lnk}{lnk_{lim}}$ in the figure fig.6. We then ignore the letter with the highest



FIG. 5. The vertical axis is number of entries of Arabic and the horizontal axis is the respective letters of the Arabic alphabet. Letters are represented by the sequence number in the alphabet beginning with Alif.

number of words, tabulate in the adjoining table, IV and redo the plot, normalising the lnfs with next-to-maximum $lnf_{nextmax}$, and starting from k = 2 in the figure fig.7. This program then we repeat up to k = 6, resulting in figures up to fig.12.

k	lnk	$\ln k / ln k_{lim}$	f	lnf	$\ln f/ln f_{max}$	$\ln f/ln f_{n-max}$	$\ln f/ln f_{2n-max}$	$\ln f/ln f_{3n-max}$	$\ln f/ln f_{4n-max}$	$\ln f/ln f_{5n-max}$
1	0	0	9038	9.109	1	Blank	Blank	Blank	Blank	Blank
2	0.69	0.205	8947	9.099	0.999	1	Blank	Blank	Blank	Blank
3	1.10	0.326	3851	8.256	0.906	0.907	1	Blank	Blank	Blank
4	1.39	0.412	2454	7.805	0.857	0.858	0.945	1	Blank	Blank
5	1.61	0.478	2224	7.707	0.846	0.847	0.934	0.987	1	Blank
6	1.79	0.531	2205	7.698	0.845	0.846	0.932	0.986	0.999	1
7	1.95	0.579	2098	7.649	0.840	0.841	0.926	0.980	0.992	0.994
8	2.08	0.617	2009	7.605	0.835	0.836	0.921	0.974	0.987	0.988
9	2.20	0.653	1887	7.543	0.828	0.829	0.914	0.966	0.979	0.980
10	2.30	0.682	1877	7.537	0.827	0.828	0.913	0.966	0.978	0.979
11	2.40	0.712	1535	7.336	0.805	0.806	0.889	0.940	0.952	0.953
12	2.48	0.736	1525	7.330	0.805	0.806	0.888	0.939	0.951	0.952
13	2.56	0.760	1494	7.309	0.802	0.803	0.885	0.936	0.948	0.949
14	2.64	0.783	1461	7.287	0.800	0.801	0.883	0.934	0.946	0.947
15	2.71	0.804	1302	7.172	0.787	0.788	0.869	0.919	0.931	0.932
16	2.77	0.822	1276	7.151	0.785	0.786	0.866	0.916	0.928	0.929
17	2.83	0.840	1169	7.064	0.775	0.776	0.856	0.905	0.917	0.918
18	2.89	0.858	1154	7.051	0.774	0.775	0.854	0.903	0.915	0.916
19	2.94	0.872	1120	7.021	0.771	0.772	0.850	0.900	0.911	0.912
20	3.00	0.890	1004	6.912	0.759	0.760	0.837	0.886	0.897	0.898
21	3.04	0.902	921	6.825	0.749	0.750	0.827	0.874	0.886	0.887
22	3.09	0.917	816	6.704	0.736	0.737	0.812	0.859	0.870	0.871
23	3.14	0.932	714	6.571	0.721	0.722	0.796	0.842	0.853	0.854
24	3.18	0.944	478	6.170	0.677	0.678	0.747	0.791	0.801	0.802
25	3.22	0.955	365	5.900	0.648	0.648	0.715	0.756	0.766	0.766
26	3.26	0.967	359	5.883	0.646	0.647	0.713	0.754	0.763	0.764
27	3.30	0.979	290	5.670	0.622	0.623	0.687	0.726	0.736	0.737
$\overline{28}$	3.33	0.988	177	5.176	0.568	0.569	0.627	0.663	0.672	0.672
29	3.37	1	1	0	0	0	0	0	0	0

TABLE IV. Arabic words: ranking, natural logarithm, normalisations



FIG. 6. The vertical axis is $\frac{lnf}{lnf_{max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the Arabic language with the lower line being the Bethe-Peierls curve, BP(4, $\beta H = 0$), with four nearest neighbours, in the absence of external magnetic field. The uppermost curve is the Onsager solution.



FIG. 7. The vertical axis is $\frac{lnf}{lnf_{next-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the Arabic language with the lower line being the Bethe-Peierls curve, BP(4, $\beta H = 0$), with four nearest neighbours, in the absence of external magnetic field. The uppermost curve is the Onsager solution.



FIG. 8. The vertical axis is $\frac{lnf}{lnf_{nextnext-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the Arabic language with the lower line being the Bethe-Peierls curve, BP(4, $\beta H = 0.02$), with four nearest neighbours, in the presence of little external magnetic field. The uppermost curve is the Onsager solution.



FIG. 9. The vertical axis is $\frac{lnf}{lnf_{nextnextnext-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the Arabic language with the lower line being the Bethe-Peierls curve, BP(4, $\beta H = 0.1$), with four nearest neighbours, in the presence of little magnetic field, m=0.05 or, $\beta H = 0.1$. The uppermost curve is the Onsager solution.



FIG. 10. The vertical axis is $\frac{lnf}{lnf_{3n-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the Arabic language with the fit curve being the Onsager solution.



FIG. 11. The vertical axis is $\frac{lnf}{lnf_{4n-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the Arabic language with the fit curve being the Onsager solution.



FIG. 12. The vertical axis is $\frac{lnf}{lnf_{5n-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the Arabic language with the fit curve being the Onsager solution.

A. conclusion

From the figures (fig.6-fig.12), we observe that the words of the Arabic language, [1], underlies the Onsager solution.

Moreover, the associated correspondence is,

$$\frac{lnf}{lnf_{4n-max}} \longleftrightarrow \frac{M}{M_{max}},$$
$$lnk \longleftrightarrow T.$$

k corresponds to temperature in an exponential scale, [40].

IV. ACKNOWLEDGMENT

We have used gnuplot for plotting the figures in this paper. We have benefitted from consultation of the book, [41]. We would like to thank the nehu library for allowing us to use the book.

- Today's Arabic-Bengali Dictionary "al-Mujam al-wáfi" or, "adhunik arabi-bangla abhidhan" by Dr. M. Fazlur Rahman; 36-th impression, 2020; published by Riyad Prakashani, 34, Northbrook Hall Road, Bangla Bazar, Dhaka, Bangladesh. ISBN: 984-32-1699-1.
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 $[\overline{q}^{\alpha}]P208, [\overline{q}^{\alpha}]; [\overline{q}^{\alpha}]P208, [\overline{q}^{\alpha}]P210,$ [JUSI] P211, [JUSIM], [JUSIM], [JUSIM], [JUSI], [JUSIM], [aird], [air[Jh6] K, [BJA] P223, [JUM] P224, [JG65], [J63] P225, $[\overline{a}[\overline{a}], [\overline{a}[\overline{a}]] P226, [\overline{a}[\overline{a}]] P227, [\overline{a}[\overline{a}], [\overline{a}]) P228$ [JINTS] P229, [TAN3], [TAN3], [JON P232, [JI23], [JN3] P235 $\left[\frac{1}{2}32\overline{1}^{-1}A, \frac{1}{2}\overline{3}2\overline{1}^{-1}A\right], \left[\frac{1}{2}\overline{1}\overline{3}\overline{1}2\overline{1}\overline{1}2\right] + 236, \left[\frac{1}{2}\overline{1}3\overline{1}3\overline{1}, \frac{1}{2}\overline{1}\overline{2}\overline{1}\right], \left[\frac{1}{2}\overline{1}\overline{3}\overline{1}\right] + 236$ [JI3M] P237, [JJ, [JJ], F238, [OF136] P241, [OTOM] P250, [goto] P270, [1000] P272, [(33] P 272, [(33] P273, [(3,3] P274, [(3,3]) P276 [Qq6] P281, [OTGATJ P296, [OTGA] P313, [OM] P317, [OTMIS], [fON3] P321, [fON] P327, [O13] P337, -E92]+343, E012] P344. [刻],[了],[了],[되动],[2100],[21010]P346,[311], [zist'], [zist], [zist] P347, [zist] P349, [tom] P348 [EINA] P350, [EAA] P351, [EINZ], [EAZ] +351, [STOI] P352, [J. 13] P357, [J. 13] P358, [J. 1] P359, [J. 14] P360, [JITTH] 7 360, [BOTO] +362, [JIOI], [JIOA] + 364,

6 [Jose], [Jios], [Jon], [Jis], $[\widehat{\mathfrak{R}}_{\mathcal{H}}^{\mathcal{H}}] P367, [\overline{\mathfrak{H}}_{\mathcal{H}}], [\widehat{\mathfrak{H}}_{\mathcal{H}}] P368, [\overline{\mathfrak{H}}_{\mathcal{H}}^{\mathcal{H}}] P369, [\overline{\mathfrak{H}}_{\mathcal{H}}^{\mathcal{H}}]$ [JIDO] P370, [JIMO] P371, [JIMU] P372, [JIM2], [JIM2], 12372, [Jungla], [Junglan] 12373, [Jangla] 1275, [Jungla], $[\overline{a}_{1}], [\overline{a}_{1}], [\overline{a}], [\overline{a}_{1}], [\overline{a}], [\overline{a}], [\overline{a}], [\overline{a}], [\overline{a}], [\overline{a$ [अभीम], [आद्रान], [जिद्रसि], [रिद्रसि], [रिद्रास], [अभिगम], [433], [439], [433] P382, [41] P383, [41], [J.T. P384, []水1 P389, [段], [段], [段] P391, [段] P392, [21010] P393. [1201], [27010], [12010] P395, [2117], [2111] P397, [21110], [2111] P398, [1221] P399, [20] P400, [210, 12] P401, [12025] P402, [210] P403, [QIM - 210 JIN], [GUIN - QUIM 230M 2308] P404, [1223], [2373]P405, [2018], [21310] P406, [233212],[27MT], [f2mTm] P408, [27M3], [27MT] P409, [125TA]P40 [2THTh] P 412, [2TU3] P 413, [T220], [2T00], [T220 M], [2TUTS] PHIL, [2009h] PHIS, [120], [210], [200], [201], [1202] Hike [270/12] PHIT, [mgr], 8149 [Brig], FIHT [Brig], FIHT [270/26] [zintar] P421, [f2a,m], [zia] P424, [ziala], [f215] P425, [INIM], [INIM] [213213], [21321], [213m], [213h] P428, [2132], [213m] [272] P429, [2721], [271] P431, [STAT] P435, [ST2] P434, [TSAT], [SIJIA] P437, [4] 21] P438, [4] aly], [41077] P439, [1343], [4070] P441, [धार्य], [धार्य] २४४९ [धुर्य] २४४९ [धार्य], [धार्याय], [धार्याय],

[F34], [STA], [STA], [STA], [STA], [TAG'], NDI, [F3.73], [GIRDM] P451, [G20] P452, [GM] P453, [3122N GIMP P459, [TOMIN], [TOMIN], [GIMIL] P454, [TOMO], [SIMISP], [DARSP] PH55, [SIMP], [TOMO] PH56 [ga] P457, [gas] P458, [ggz] A), [Sus] P460, [SUJA] P461, [cla] P462, · [I] P463, [IIII] P466, [I] P466, [I] P467, [I] P467, [I] P469, $[\pi rod], [\pi rod] P + 71, [\pi rod], [\pi rod], [\pi rod], [\pi rod] P + 74, [\pi rod], [\pi rod], [\pi rod], [\pi rod] P + 74, [\pi rod], [\pi rod]$ [了"明], [帝受] P474, [下的), [帝知,] P475, ["[mil] P478, ["Jatri] P479, ["JWIA], ["TMA20] +481, [- 1, [- 1, [- 1, 2,] P482, [- 2, A], [- 1, 2], [[TI23], [TIA] P486, [2]ata] P489, [2]BJ, [Date] P490, [2]AJ, [2BJ], P491, [1]00], [210] P492, [210/m], [12/21/2], [21/20] +493, [211,16], [12] , P494, [21130] P495, [straf] +499, [3'5] > 501; [13'5] > 501, [13'0] + 502, [32], [302, [30], [100], [100], [100], [200] [30[0] P504, [30[01], [30] N] P505, [30[], [30]) P508, [foni'], [fon'] 1>511, [fon 20], [onia], [an, n], [oni'], الساهم إراد الدوم إلى المرد المرد] , [توجع إ مردم المردم] [3124 [astze], [120], [120], [120], 2139 ["Timer], 4124 ["IRE"] [off], [ogm] p517, [for 2] p519, [onto] p520, [og 1, [og 1,], [og 1, [ogto] P524, [out n], [ostin] P526, [sale], [asa], [ostin] P527

(d) [The str. [The str.], [The [334], [72] P531, [330] 7532, [331] P533, [31M], [](], []20], []10], []10], []10] P534, -2TTS] P535, [2110Th] P537, [21105TM] P538, [1210], P539, [1270], [2] Total [Thanks], [Simils], E+3 ([Signes], 5+34 (STELS], 5+34 (STELS] [ADAM], [MEIS], [MEIS], [JUSEL], [JUSEL], [MAR], [MAR] [21], [210], [21] P549, [JIJ00] P553, [JOITA], [J'0] P555, [JUJ P557, [signed], [of parker], [storker], [st [320 x(20), [x123], [x1210], [561, [x121], [x121], [x121], [[stato], [stato], [fsto] > 565, [fsto] > 566, [sto] > 567, (07 24 [UTASIR], [UTSIR], [GASR], [GASR], [GASTR], P370, [JIME], [JIME], [JIME], [JIME], [GIGIE], [GIGIE], [GIGIE] [SIMIE], [SIMIE], [SIMIE], [SIMIE], [SIMIE], [SIMIE], [SIMIE], [FIRTO port to] > 577, [JIMIT] > 578, [JIMIT] , 5739, [JIM OME], [Jate], [Jace], [Jaia], 0884 [Silair], [Jate], [Jate], [ATTA] P582, [ANU], [MMTH], [AN'] P583, $[\pi_{12}], [\pi_{12}], [\pi_{$ [alig], [AR], [AR], [CEVE], 1886, [SK2], [SK P587 [], [B], [BZ [[BZ]], [BZ]], [BZ], [(Real (and), [comp], [some], [some], [some], [some], [some], (of other], [sim and], [of billing], [of the], [[Miste], [[mos], [miszi] P603, [misz], [mise alz] P604,

[m] 25] P605, [m] , [2013 [25] P606, [m] , [m] [Imre Sits], [roe atte], [miles], [times] > 608, [solut]" [1] 24 [alarina] '01 34 [jarla] '[édriba] '[ilariua] '[ilariua] [m][], [m] p612, [m][m], [m][m]] p613, [m][m] p613, [2012m/m/2014, [m/121m] p615, [m/120] p616, [m/133] +617, [m/130], [m/130], [m[13m] P619, [m]2), [m]26] P620, , [JTQ0] P622, [JT6] P624, [J03] P626, [J02], [203], [200], [TEON] P627, [JIN], [IND] P630, [IN], [IN] P631, [Rol P632, FROND] P633, [RNB] P634, [ROTH] P635, [[[]], [[]], [] P636] P637, [], [], [] P638, [fgath], [fgata] P640, [gate], [fgat], [gata] P641, [[120], [TEAR], [EATA], [TER], [TERA], [TERALI, [[x30], [x3], [x36] P643, [y20], [x38] P644, [x20] P645. [ho6], [fhon] P648, [H2m], [Mh], [Mh], P649, [ho1] A650, [Top], [Tho,], [Tho, 3] P651, [Those], [Thore] P652, [Thore] P653, Emiliano [hata], [ha], [ha], [hazire] P-655. [000] P662, [000], [000 [POID M PEEE, [UMF], [UMF], PEEF, [TOMA], [UMP], [UMP], [mim], [ma], 1670, [2,70] P670, [220], [J34], [J37], [20] P671, [U320], [U330], [U31] P672, [JS] P673, [Utal P674.

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[mth] +845, [moin], [moin], [299] +849, [mj], 2484 [min], [moin], 2484 [min], [min], 2484 [min], 250, [mitil] P851, [mitin] P852, [mitin], [mitin], [mitin] P853, [mitin], P854, [mgor] P856; [mgay], [mgaz], [misio], [misio], [misio] P858, [migia] P859, [MIDD2] P858, [MIB], [MIBIA], P860, [MIBZ], [MIB2] P863, [m13], [m132] P864, [JAN] + 869, [JI'A] P873, [JTOT6] P880, [JOP] P884, [[] [] P896, [] P923, [] P929, [] P935, · [700] (1464 [10,6] , 7269 [3,616] , 7269 [3,616] , 3269 [1016] · [JIRT'] P945, [JMO] P962, [JMO] P963, [JIMA] P964, [fay], 87894[tolk], 8784[Tag tig], 37894[sente], 7384[sylan], (ELOIA [ERILE], POOLA [MIRILE], SEE 4 [MIRILE], PREA [3]16] [JIMI'] PIOIS, [TAMP] PIOIS, [TAMO] PIOIS, [TAMO], [JAMO] PIO20, [TAZTA] PIO44, [JIST) PIO51, [JP], [JP], [JP] PIO55, [JIZO] PIO57, [alm] P1059. -[ATO] PLOGO, [ATA] PIOG2, [ATV2] PIOG7, [ATOT'] PIOG7, [MIDU], [[]], [MIJH] PIOES, [MIJ], [MIJ], [MIJH] PIOE9, [MIJH] PIO71, [NTOTI], [ATTENT, [ATOMN] PIO72, [ATOM], [AIGHT], PIO73, FFOI 9 [TRICIN], [ATRI] PIO76, [ATR], [TRIN], [TRIN], [ARIL], [AUDIAL MEAN] PFOID [STRIN], PFOID [STRIN], SFOID [MEAN], [SILLIN], [NITHI], ENTRY], [NITHI], [NITHI], [NITHI], [NITHI], [NITHI], [NITHI], [NITHI], [NITHI], [MTG], [2017] HO84, [2016], [MTG20], [ATG] PIO85, [MISTU], [MITTU] P1086, [ATTU], [NITU], [NITU] [MIGONA], [JERNA], LEVINIA], LEVINIA], LEVINA, [MIN], LEVINA, [MIN], LEVINA, [MIN], [MIN], LEVINA, [MIN], [[ISIN], FEOID [NORT], CEOIDE [MOLIN], [ERCIN], HEOIDE [RECIN], [ATTAL I LATERS, [ATTALS], [ATTAL], [AT

[ATT], [TROM] FILOO, [TRO], 1011 4 [5 647], 00114 [MEAR], [NTER], [NT2] PIIOS, [NT36], [NI30], [NI30], [NI36] PIIOS, FOILD [oth, 30119 [OTUAT], [MEIN], [OCEIN 2131 / PIIII, [276] PIII4, [2761820], [1250] PIII5, [2100] P1117, [mais] 1118. [famtin] 121, [fai], [Just] 121, [121] 121, [121] [II3], [II3] PI125, [II3], [II3] PI126, [II26] PI128. [3011], [2276]] + 1130, [3210], [3210], [3210], [3210], [13710 [5007], [510745], [507145], [1007145], EE 119 [MOUTES] [30151N], [BUTTET] PIISE, [32103], [BUTTETE], [SUTERINT] PIISE, [321 Fild] PII39, [130 h] PII40, [32100], [321700], [321700], [אינדנצ], [שלווא [שלווא], [אלגרעצי], ואווא [העונצ], [אינדעצי], אינדעצי], בהשנה], [שותושוע], [שהועצ], [שהועצ], [שוגועצ], [שוגועצ], [שוגועצ] [SUISO], [AZO], [BUTZO], [ASUTZO], [BUTZO], [SUIST] PI146, [BUTG], [BUTKE] PILLA, [BUTKA], [BUTUS], [BUTUA] PILLAS, [BUTONA], [A. an], [3073], [30723] PII49, [3737] PII50, [37314] PII51, PUSE, [3)TATA [PIISS, [3)TM] PIISE, [3)TRA PIIST, [3)TRA] MI57, [32122] PIISS. [SUTTRO] PIIS9, [SUTORS] PIIGO, [SUTI] PIIGI, E 2011 8 1162, I 2017 [2018 1 PH63 # 842

Words starting with i (31) from other litlers sections 0 [BI32TILM OITOT'] P26, [BM - 2320TO] P27, [BI320TIZM OITOT'] [fant - 20,017m] P37, [fa- OIE,010 20] P37, [JOSTM] P43, [fartosta] P51, [fam- senter] P51; [and anersistan] P57, [कि के को ही के को ही], Fe 4 [दिही हो 10 - हो], Se4 [को क हो हो में 4 [Fant - State of [Ant] P 112, [A (Data] P 117, [And State] P 143, [famffa] p151, [fax62f8] p166, [fam - xats] p199 [fau - OTHTZ m] P267, [fau - OTHTZ, Jubi] P268, [fau - OTHJOBI] P268 [13 - OTH gold] P269, [100 - OTH gold] P269, [130 - OTH [AU - 010 010] P273, [A - 0150 20 1 - 01 - 010 010 - 010 010 - 015] 8297, [for - un oto] P306, [for - UN that] +329, [रार्ट्रम प्राप्ती - हो] , 1289 [होत्रीकी] 1289 [रिर्ट्रम] , 1289 [fant JIL 32] P361, [fa-JINT,] P370, [fan - JUNT] P376 [- J 26 Gr Ja ME2], [CIL Gr Jamia] P376, [D - JIA ME2], 127 $[\overline{B} - \overline{B} -$ [fan - 213FB] P401, [files- b] , 1049 [GIES- MAT] , 1049 [1]- 町像水] P416, [1]m - 虹像] P416, [] ??? 或州 虹石] P422, [(1)] [1] [1] - 2122] P 430, [1] - 2122 (1)] P 430, [2] - 2122] P 448, [(1]] - 2122] [1] - 2121 M 2[2] P 448, [2] - 2123 3] P 462, [JI222 The atain] PHTH, [13 - Figtion] PHTT, [Ah-4137] PHEL, [南小 - 町5水] P486, [南25-2170] P488, [因-南25, 夏170] P522 [位-部蜀田(32]) 2527, [位- 初分2152] 2533, [716] 2132173] 147, [A-SISTA] P559, [A-MIA] P595, [SINTO WI22Ta] + 600, [TANGAN [A- 563 TIDN], [A- RUTON GTY 512], [A- RUTON GATE] P635, [18- good styst2], [13- good configer2] P643,

ENGLACTION IN STATI AND CALL
[Ah - hojai2] PGS1, [A- Gana] P-607, [ai2n uis 20] 7011
[JIS-11 2523T NESTON P678, [A- 62JTODN (593)] P685,
[JIMINI FAMM & Gato 6 JOUTA] P688, [TAM-60103]P712
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[13 - MIR A LOISIN - BAJ , PEFA [MIDD OFCH A JATT - BJ
[A-20Th [m] +767, [A-3Th T3] + ts), [10m - gio, 10 10m] 113,
[AN - 3187'S] P803, [A-31MIT], [UTIMITS], [B-31MITS], [B-3187]
[Fan - 233212] P 814, [13- 21510] P 823, [-12- 7111 BIFON]
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F AM - JATO JE (11) P1000, [Pan - STAMO] P1007,
$\Gamma \Omega = STISISITO PIO27, E-STOPPOINTO [13-STADIO],$
Γ at an 21 march = 10 34, $[f - J + The], [f - J - J - J - J - J - J - J - J - J - $
[A, - MOLJE2] PIOTO, [A-MB132113A] PIOT3, [MA MA]
P1080, [JERTHANDO], [R-ANIA ANDO COMA, 100, [R-ARPART]
[ATOFICA - AND EONA [STUS TERN AND] [(ATOD OUNA ALOUR - A)]
P106, FB - 32TBOT, [Fam - 32TBOT2] P1130, [10-3216, 1214136
[A-32/15F0D] p 1143, [A-67 72~] P1148, # 129+1

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Wonds storting with U[J! from The other litters' ection (including plumal + feminin gender) era [State], era [arteare], sia [arta [arta], fia [arta] [aligned] 614 [aligned] 614 [aligned] 614 [aligned] 720 [ONR ME2] P22, [20,1 for 12] P23, [0,17213] P24 [201 QITUID] P60, [Tab - CET], 242, [Tab - Oraly] 245 · [10-21702] +488, [3707] + 868, [10n - 2016] [13m - 221512] PIHEI, [130 - 016 attac] P295, [12 - Oprila] P306, [133-351] 120 () # 21×2+12= 42+12=54

-Total # 129+54 = 183+1 +1 = 184

Would's starting with "(01) from other lithers' sections [OFMAS 2010-14] PIZ, [DIZOIN 2410] P50 [otto com of smr2] P376, [O'star countint 212170] P430, [OIGala 13X] P655, [OIZIFGM JOIZIM (AM] P886, [OTH dia idgi is] PH52, [OTZOTAT ZUTA] PII61, [OTZOIN HUSA] P1089 [OTH JIS 102 101 10 10 MT2 252pm JISh] P822. #11 [OTMJ 35 6m Jointon, OIMT2 252pm JISh TISh] P822. #11 [OTMJ 35 6m Jointon, OIMT2 252pm JISh JISh J P822. #11 [BUI 9 31 6]= 27, [DIRIME] 128, [OTZMATATING), [OTENTYN TIS] # 5 Would's starting with b [OF,] of mon other litlers' sections [MU MI CI J FIG92 [catum Draim] P759, [satur Mosa] P1089, #2+1 Tatal # 2+1 = 3#1 +1 =4 [OUT & 321TAT] PI16 # 1 Wonds starting with i (IT' - from The Litter's section [togtan anoth] PISH, [yth Boalthm Marain] P827, [+ 3 . + 3 [+ 3] + 3] + 3 [GITYON] P30, [OITYOJ) 054 [BOTYND] NOTYND] NOT # 7 Total # 3+7 = 10 2. Wonds starting with wo (3h) from other litters' sections [[] 212172 JIZHT'] P239, [JOJAN QILM] P661, [दिंग्रही त्वार्बीत, रिंग्र त्वार्बी] २ ९ ६१, [उनीर्बे होलाउ] २ ८०७, [2 2m (32)Th] P 815, # 6 [aryai] PIOS, [aryain], [aryan] PIIO #6 T.tal # 6+6 # 12

T. (Jrla) from the other letters' fections Would starting with [RE2] [miro 21 [miro 21 [miro 21] 2009 [miro 21] 200, [GIGITZ], [GIGITZ], P32, [GIGIZIZ]P34, [GIGITIG]P35, [GIGITIM]P35FE4[SITH[SITE], 5E4[SITE], 2E4[SITE], 2E4[SITE], <math>SE4[SITE], SE4[SITE], SE4[aid, m], 824[interval], 784[interval], 784[interval], 784[interval], 784], [aid, m], 784[interval], 784[inte[ard [arus 130] P38 # 2×9+5 Total # 4+23 = 27 with Z (21) from the other litters letter words starting [2000 213-2102112] P26, [27M12 2000 210 212] P34, [f21) = M OUTATA] PISH, [2137 M OUTA] PIGI, [213, MT2 SATO OT BUTO] PUS [ราบเราโล อบเริณ] ไม่อา [รายชโพร สาสาริมาราย คราย, [III =0 OTET 33 m] P 256, [ZISTOO OTZIM] P274, [IZITZO OUTTAM] P304, 「エアオイギリシャ しまれる」トム名を、 「 ショるある きをあい 行きびす」 アラント、「エのよっと」 ひびのえのろる [2131] JT(J-2] P552, [2] JT JM MIJJ P614, [2TIJMO 07, 201] P657, [21] [1] OTAN, [200 P659, [2] AM JIL) P800, [2] AM JIM JIM J P808, [27/274 (2020) P 822, [26/730m Toma], [212/2010) [212/2] P834-35 [2320 mar] P865, [27512 57 2 27572] P868, [23320 340] P970, [21312 JAISTER (212 PIOHA, [237 ATTA TEST), 27019 [2705] PIOTA, 12372] # 32 [CUIZAR], 239, [CUIZAR], 243, [CUIZAR], 244, [CUIZAR], 259], 259, [CUIZAR], 244, [CUIZAR], 259, [CUIZAR], 244, [CUIZAR], 259, [arzanz] P46, [arzia] P47, [arzanm] P47, [arzanz] P48, [arzal] P48 [ماري مي المراجع (مربع عالم) معدم (مربع علم) معدم (م معدم) معدم (مربع علم) 2×10+5=25 Total # 32+25 = 57

Nonds stating with
$$\mathcal{P}(\mathbf{z})$$
 from the other litters' sections
 \mathcal{L} 222 ar2 [\mathcal{L} 242 ar2 [\mathcal{L} 212 ar2] \mathcal{L} 265, [\mathcal{L} 242 ar2] \mathcal{L} 272 ar2],
 \mathcal{L} 272 ar2 [\mathcal{L} 272 ar2] \mathcal{L} 265, [\mathcal{L} 272 ar2] \mathcal{L} 272 ar2],
 \mathcal{L} 274 [\mathcal{L} 270 ar2], \mathcal{L} 275], \mathcal{L} 270 ar2], \mathcal{L} 270 ar2],
 \mathcal{L} 274 [\mathcal{L} 270 ar2], \mathcal{L} 275], \mathcal{L} 270 ar2], \mathcal{L} 270 ar2],
 \mathcal{L} 274 [\mathcal{L} 270 ar2], \mathcal{L} 270 ar2], \mathcal{L} 270 ar2],
 \mathcal{L} 270 ar2 [\mathcal{L} 270 ar2], \mathcal{L} 270 ar2],
 \mathcal{L} 270 ar2 [\mathcal{L} 270 ar2], \mathcal{L} 270 ar2],
 \mathcal{L} 270 ar2 [\mathcal{L} 270 ar2], \mathcal{L} 270 ar2],
 \mathcal{L} 270 ar2 [\mathcal{L} 270 ar2], \mathcal{L} 270 ar2],
 \mathcal{L} 270 ar2 [\mathcal{L} 270 ar2],
 \mathcal

,

Wonds stating with
$$\dot{C}(GI)$$
 from to aller litters series
[Altrians Sational Suits] Par . [Styrer and Tabs] Prech,
[Altrians Sational Suits] Par . [Styrer and Tabs] Prech,
[State an estimation of sites] Par . [Styrer and Tabs] Prech,
[State an estimation of the suits] Par . [Styrer and Tabs] Prech,
[State an estimation of the suits] Par . [Styrer and Tabs] Prech,
[State and estimation of the suits] Prech, [Styrer and the set,
[State and estimation of the suits], [Styrer and the set,
[State and the set, [Styrer], [Styrer and set], [Styrer],
[Styrer and Par . [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer], [Styrer],
[Styrer], [S

Total # 5+14 = 20

Words dating with
$$\dot{\omega}$$
 ($\overline{u}\overline{u}_{h}$) from the other letters' sections
[\overline{u} hitigm still pro5, [$\overline{u}\overline{u}\overline{h}$ lipican high pro68, # 4
[\overline{u} hitigm still pro5, [$\overline{u}\overline{u}\overline{h}$ lipican high pro68, # 4
[\overline{u} hitigm still pro5, [$\overline{u}\overline{u}\overline{h}$ lipican the pro68, # 4
[\overline{u} hitigm still pro5, [\overline{u} hitigm pro5 # 4
[\overline{u} hitigm still pro5, [\overline{u} lipican the star letters' sections
 \overline{u} and starting with \underline{s} (2011) from the star letters' sections
 \overline{u} and \underline{u} and \underline{s} could \underline{s} (2011) from the star letters' sections
 \overline{u} and \underline{s} that \underline{s} (\underline{u} \underline{u} \underline{s} \underline{s}

Wonds starting with J (3) from The other Letters section [उड्डीयूल क्रिंग्ल] +396, [उडिज्रा माछ] २५२१, [उर्श्वहेल कर्डार] २२१२ 576 (16) TOTE MENTISET], 3887 [METMIRION 655] [ADDITION PS20 [GIMON], [JIZGIO], 839 [BIEGO], F39 [IMIDAIO], F39 [JUN] [Oner] De d' [Onsécuri] b do ' [ansister] ' l'and and b do' [aussia], [aussia], [aussia], [aussia], [aussia], [aussia]), [aussia]), [aussia]), [aussia]), [aussia], [aussia]), [aussia], [aussia]), [aussia]), [aussia], [aussia]), [aussia], [aussia]), [aussia], [aussia]), [aussia], [aussia]), [aussia], [aussia]), [aussia], [aussia]), [aussia]), [aussia], [aussia]), [aussia], [aussia]), [aEF4 [mitszin], SF4[irce, sin], [arce, sin] # 2×13+4 Total# 5+3035 words starting with we star from The other litters section [A21300 OIGONA] P317, [Arian Jan 2012] P376, [JIL 2] 2386 [यान्ता वक्तात दिगोदिगोत] २५२५, [र्फियोक्य २७३२र् विक] २५४, [JINT2 4020172] P655, [JEm JIZH] P800, [JIZMM 192174] P815, [STERM (STE) P929, [BAR MESTE] P1160. #13 [argin], [OITMETIND], Equiparterind], [OITDETERIND], [OITD[ONAMIST], [ONAMIST] P100 # 2×4+7 # 15 Total # 13+15 = 28

would starting with wi (with) from the other letters rections [mintym 2221 2] P45, [mintym 31'3] P207, [mintym 2] P548, [mītéza istat'k] P745, [minityar tatata] P929, [maz gazilar) +1032, #6 [armin], [aremin], [ormin], 1014 [erremin], 2014 [erremin], 2014], [armin], 2014] $[anm^{6}and], [and [and], boig[and], boig[and mind], [and], [and$ # 2×4+5 [m]1800 45th] P654 = 15 Total # 6+15 = 21 Winds starting with E (STEAT) from the other letters' entions. [simile artigare] page, [sings miger] peou, [sings stand] preu, [sitz alter min - Isa [210] , 8879, [BUIDON 2013] , 28879 - min motile site [गार्टव बुर्ग्णवेंग्र] Р 10 10, [गार्टव बुर्ग्वेम] Р 1025, [आर्टव बुर्ग्ग गर्ग] २ 10 17, [sitzo angtatu] Piose, [sitzo angzio] Piose, [sitzo angtato] pion, STYLES MERICANTES PLICO, # 16. $\begin{bmatrix} arristing \end{bmatrix}, \begin{bmatrix} arristing \end{bmatrix}, \begin{bmatrix} arristing \end{bmatrix}, \begin{bmatrix} arristing \end{bmatrix}, \begin{bmatrix} arristing \end{bmatrix}$ [3412 281'] P640, [ST150 21847] P1025 # 8

Total # 16+8=24

Wored's starting with E (DIZA) -from the other letters sections. (a) ["OTTAN LETDAT"], ["OTTAN 24 P34, [SMATNIA] P37, [5 2mg m f25] P45, [6 2mg [6 alm avizor 2] P67, [· ainton 202020 [other 2000], [· 29 ~ [other of 2000] P 115, ["OURTRIOT of [PIST] PIST, [STORT] PIST, [6 OIMTIM OIZIM] P139, [6 27 41M 200 [A] P159, , [" מות בתוני אדענה לא בתונה אות ביכא בית אות אות אות בינו א בינו אות בינו בינו אות בינו א ["and anglars] >222, ["and This and Joins] >238, [6 ONTAT 31212 ATBS TON P240, [6017] gamm2] P243, [EQUATO OTHIGH] P268, [E2MOJ 2 20,012] P272, [EEMOJ 2 20,01] P274, [21000 OTMISTS] P285, [62/1000 OTMIZM] P286, [OTMISTO [62mgo 015152212] P302, [601m10 01939], 016 [60111 24 1282] P348, [6 OTFIZIER ZIMTORITE] P350, [6 OTTIGR STHBZT] P361, Eaning महारी की 1262, [62मंड्रम मार्गेसार] > 366, [2011) मार्ग साम्म, [6 CHAIM JAND], 3769 [MIBIE MATER, 623], 3769 [214 ATO), 67879], 8769 FEGY 2020M JUAT2] P378, [6278gn BUNG) P379, [62701 2Tors] +386 ['आमाल टर्गाइ के 2884, [ब्लामी द्वाले राजा 2889, [ब्लाम राजी, [EGUINT STRIN \$, [EGUINT STRIN],] [congion 274th], [count 21212] +399, [c2ngm 210012]+403, E कार्त्रा रिक्रॉन्ट्री, [6 काली टाकाटी P406, [र्टन्सू हूल 2701) रोप P409, [601ml griftim 27276 7430, [601mlm 12276] P+30, [601ml offician] [EQUIN ONION STAD] P435, [EQUINT 32170, 12m 252) P448, [601MTh FISTED] P484, [687172 2TAUT2] P485, [60171 ASTADI] P514 [6 OTTESTE 2 36 POITE 2 18 , [6 OTTE 2 12 2 11 2], [6 OTTESTE 2 36 POITE 2 18 2 34,

E [12mazz 24mitrim] P543, [6011 Mark 1 P559, [1011mit 1231mit] P559 [62mgg [3] 7629, [627, [627] P651, [6017 Off) P664, [601TA 03) [2104] P671, [601MID 2M] P672, [601TA 013m 6) TOS), [- OTA OTAMAN STEDO], [- 270 QUO] PETS, [- 270 21 21F2 JF0] PETS, [62mgm Brita12] P759, [62mgm 2016] 2210] P767, (6 FF4 [RIDEIR ETTE TRID=], CFF4 [EBIOS MIMID] , ४९९५ [होहाडू माठेन], म्हापू [म्हीमहताय मिताय भे, अ्मि होहाडू गड्राय) 2011 - JUST MATSING THATE A [MATSING MILD], DEFA [OFA [OFA] , DEFA [OFA] , DEFA] [6017ml 2012, Tohn 123] P& 26, [60171] 23, Toh, 601ml gra, F28 tohn 2] +829, [62mgm 313[m] P842, [3/2 A [010] P874, , ९५९२ [मस्वाद राझे, हाफ रामादा), ९८९२ [द्रामाह हरी साम काला] [Gant micous tand] [Gant anti anti anti P 973, ["alimit BID 331800 (21) F1004, ["Gaisors BID 2012] 1006, [6OITME TAMISIE ME , [MILTE FAILE FAILE, 6001 4 P 1043, [601ml जार्ग्लेग], [601ml जार्की ग, [601ml), [601ml [EZMERIN FMID), L'EOIG [PRASID] PIOSS, court (Britain Thillion), REDIA [+ LA ATAIN MIMILO , ATAIN THILON] ["OITMENT DI3217"] P1124, ["FOITMENT 2T32172] P1126, ["\$ 2mgm 2T2013] F 1127; ["ant subjor sufferiz] FII34, ["ant suiter 12] P 1136, [6 OTMI 321TMJ &] P1145, [6 OTMIN 13 MT'] P1155, [व्यात्ती रेगाम, 6 जात, रेगाम), [व्याप्रिम रेगामी मार [6017 225 ptr] P1163; # 117

()[On⁶ 320], [On⁶ On⁶], [On⁶ On⁶ $\begin{bmatrix} GII^6 mID \end{bmatrix}, \begin{bmatrix} GII^6 mD \end{bmatrix},$ [0163Th], [. 0163TD] + P 123, [016 MM], [016 32TL] p 124, [601mm 3 3172 mm b) > 520, [601mm 3142] > 213,[6 GUTH gm ge g] P 609, [6 GUTH] ft stip mg <math>[127 M](1)[FEA [horn all Fulles] # 2×5+ 13 10+13 23 Total # 117 +23

= 140

words starting with is (201) from the other letters sections a [21778 m 1225151] P45, [209 GUTYAT'S] P31 [20/07 5270] P29, [20/01/05 2 3210/00 35/0/] P97, FITA [EIMIETTO MOST], OIIA [MISTIG MOST], [214 [र्म् भोरामण केर] , 8614 [भर्त सह करीक् गर] मार] [28] जाउर्मे कियी] २१९२, [28 नार्या जाउर्यो कियी] २१९२ [201 BUTUTON QUE P212, [DE - OUTAN P267, 1 259 [FIGTAIZ POS], 8169 [OSPACTMID Pas] [201 Jafan miza] P378, [12m - 2Tm] P389, [201 2414] P396, [201 - 21203] P406, [201 arzita] P412, [Tom - 218 1812] PHIT, [201 21(2)], [201 51121021] PH31, [120m - STTER] P434, [120m - 134 512] P440, [201254 418] P479, [21 3, 20 ONDA MET3] +496, [21 ONDA, 2) + 506, [21 statist] P559, [2018 gim 03212] P597, [201- 5Te tain] 1624, [201 5TM2] >625, [201 5 5112] +629, [201 2] 2112 5112 50, [201 1012] P655, [201 03,2010 60127] P664, [201 03/2021 2m] P664, [201 027227] PET3, [2010 Tolos [201 62476] PEJO, [201 62476] PEJI, (WIL WIL 100 OTTOM 12], 0449 [ATTE P2], 0679 [WILL WOOD], 0679 [WATTER WOOD] [2017 - आहा न , 1884 [कोर्य कार्य कार (201 1010 100 10 2 2 2 4 [P MIN NOTE TETE Pac]. [100m - For UT2] P866, [2rd Egyrid] P923, [2rd offin] P983, or or [statom- rad], 32019 [Entertating has], PPP 9 [mitstage has] T ATTHON PIDEI 47019 [5 m TO & m2 TE ATO MITE POL] . EFOI9 [40TILE 1071- ME] [201 WERDI PIOSH, 12017 (1267) 1089,

A) ENNA - (ASTENZ) + 1103, [AM AN], E ON 4 [STETER) - NAR] [DEMA 3211276 287] PII34, [2nd 3211210], [DEM 22114], 84114 [201 32175727 NT2T0] PI147, [201737m 32765] PI150 [2M] [le CTRICE las], 00119 [STUS 3216 2) PII52, 2 211 1 [RETEILE EIZIN RS], [REFINISIN GIEILE MAGI] [HITE THATEDRICE Pacz, 1201 4 [CATIGE MERISIN Pacz], · [201 (दियो दियो टे किसी हिंद्रोय किट] · # 7 0 + 1 + 1

[ango] PI31, [ango] PI32, [ango] PI33, [QIRDMIZ], [QIRE 32/12] P134, [ZETTETT 36 30] P609 FOLLATOL PIEI # 9+1 Total # 70+9 = 79+1+1+1 = 80+1+

- 82

= 81+1

Total # 13+15 = 28

Would's starting with si (20520) from the other litters' section. [JUN - OFO] P29, [AOFZM SETOJTA] P120, [JUD-OTM] P242 [300mm2 2713872] P387, [31-27 ATA MEA] P388, [Jugante Motolite] P491, [John Margon Faz,] P564, [TOM - MTREIN UTEREN], POR - ge OTH] P98 a, [TONT - MP5], FOIL 9 [OTH] - MP5], [2mm and 2131 321 4131] PILLI, [2mm 32) F124] PIL29, [2018] SUTAJ PIL60, [2mi 2013 ANJ P1164, [argan,], [argan] , 1,14 [argan] +142, [argan], [argan] , 1,14 [argan] , 1,42, [argan], [argan] , 1,43, [argan6], [argan] , 1,45, [argan] () # 13 Total # 14+13 # 27

Wondos starting with J (MIA) from the other letters' sections. [im - QID] + 16, [mt 22520101m] +43, [mt 2625] +46. [m] 16 17 [har a rice Im], P 219 ["garade Im], 1119 [gio 22 Im] [mit grimiz ising) P211, [mitzmitz Jizit'] P239, [mī 2010151221'6] P254, [m-2112] P396, [mī 212] P397, [m] 1049 [néera résern], 1649 [m/2 - m/2], 1049 [réers Hn] [命-2开命] P493, [命-576013-2] P552, [mit Gmont] P577, [m - si 2n 2D] P 586, [m - sTAT] P625, [maigh 4Th] P646, [m] = o [m1-otatio] P659, [mto ata mts], [mto ata o m] p718, [mile and] + 718, [mil at a for the size a solution] + 26, [for - milesta], [TAT - MIZIT2] P730, [MI SUZZIT], [MI SUZZIT] P736, TWI WITE REPORT IN], F4F4 [52112 FM], 04F4 [MAINT THAT [TT STERIE STA LANDIN INSTRA [STA ISTORED TA], FF84 [STA ISTICIENE TA], , 2009 - [PMBI IDIMIETE TM], [IMIETE FM, IDIMIETE FM] (4269 [Sim Mising Am , 418 9 [MIDS METE TH] 8894 [SIM FARE FM], FOPA [SIQOOSITE REPETED], 2494 [ETTRIG FM] [MT THAT ZIOI & OTH] PIO 33, [MT STIZED I TAND] PIO 46, [MT STATI] PIOS, Emit 22111 22 Find [BOINT MILL AN], OPOIN [STMIE LUM TM], 08014 [STMICS FMILLS [mt Bon - 20 IN I MA - HON I EPOID , [MI 26 MILE 5/ - IND) [An - (Nation] P 1103, [Am - 120, 312] P 1113, [Adati] P 1115, (2211 9 [notime sive alles alle - mi], 2 2119 [, letingue - mi] # 60 FUIL [PRIE STEE THIS

 المالي
 المالي $\begin{bmatrix} (1) \begin{bmatrix} 1 \end{bmatrix} \\ ($ # 2×8+5

+ 16 +5 + 21

Total # 60+21 = 81

Wonds starting with p[sts) from the other litters' sections (a) [कार्यकाय स्ट], esa [to rice सट], 254 [मार्ट्याय टरास्ट] [STOTZMA 290] PIOI, [ST2132 2051W] P68, [314 3912 26 HT (2) 121 , [3 MTG 29 M CUI2076 \$] +133, [316 30121 27, BUIDUIT2] P165, [314 20181] P182, [किन द्वांके कार्डान्य मंद्र दिलाएडाउँगा मंद्री 2, EIA [मंडीहार क्रों 2] , FEIA [मंडीहार क्रों दे मंडी [किर्मामार जुर्धाविशार], [ज्याव्हि जुर्धाव्ही] P210, [โลก สูโล สูโน] P211, [สูงอุณา อินโบโ2] P212 [ST gramo otales] P242, Ean Githing P361, [Taw Gitatai] P365. [5134 Tomment] P 372, [5001320 Fam - UNAT M] P376, [राह्काद्रा भट्राहाकट्राय], र रह प [टाराट्टे मिली प्राकार्याय] E 869 [BEETE FATE], PFE9 [TEMET J, E869 [TEMET] , महा महा हारह मही मार क्रांगू मही , महा में द्वांगू मार पार हार 10 में दे महा मार के के महा मार के महा में में [Imis]A409, [galym 27M1 of] P409, [STIMM 272170] P430, [STAT2 875] 1436 [TH GIOJOI] P451, [TAN (SATTA] P454, [TANIN STAD) P455, [AT GITA 20] P.455, [JISTON HISTIGS) P476, [BA GTA] P485, [जुरुङ्गर्भ मूग्रिणारी P485. [जुर्भे देल भारते हो] P491, [जुर्मे देपुर कर्तुनि] P503, [र्जामी जिनक प्रसुत 327ामी], [जामार राष्ट्रत अर्गमी राष्ट्रत] २५२६, [An steand 2] p552, [statas shatar2] p575, [at mingon] P595, [fan Ealtan 31m] P641, [fan frain] P654, 「和4[ASTR-AR]、F2F4 [mを1103 millerの史屋]、PIF4[5mm mを112310 小屋] [ZZFA[WIDTAL IFMID THE THE TE], [HUGHAL TE], [HOIDTE TE] [An 2013/02 P775, [210 2 OTO 30 10], [2779 [2016]), 2779 ् २९२४ [हर्षहाक मही] , १९२९ [क्षेत्राक महीमड़े) , महन्द (मुनेह हेल्लाह] [A, 31777] P786

F [2] A [astminite site stand , 7084 [enter maintag] + 231, [BREAT ABA] 2835, [BAM MINT] 253, [BA NFRZITA], [TAN ATTENDA GYJ] PIOGI, [BURNANDIN NOTICETA MATTENDA , [BALLY MINE MINE LIGH SUIST'S], [BAN MINE SUIST'S], [BAN MINE SUIST'S], [139 [33 alogant Eym 2 2012 [] + 11 46, [27 2] 21 (20 12 2) + 1152, [कोर्याह कीहार आपती] , [कहार्ट प्राइस हेराह कार्यात [मिगाएर प्रेत #73+ [131 221332] + 1165

[angara], [rean], [organ], [urgara], Fera [, siran] PISS, [augians], PISS, [auguno] PIGO, [am] PUSA, [fal 2014 [artifico] P768, [20103] P770, [372] M forta] P790, [371316 QU12] P810. # 2×4+7

T.tal # 73+15 = 88+2= 8990

= 15

uends keing with
$$O(q_1)$$
 from the iden (illus) section
[Integra and the constant of the con

wonds starting with is (12) for my aller liters' ention eong [emits meetics], 2789 [rest [rest], 2609 [stars] aller , 2009 [ethits meetics], 2009 [stars], 2009 [stars] , 2009 [ethits meetics], 2009 [stars], 2009 [stars] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics], 2009 [ethits meetics] , 2009 [ethits meetics], 2009 [ethits meetics],

[221 3 g m 2014 m] + 7-66 # 1

Total # 13+1 = 14.