The French, Larousse Dictionnaire De Poche and the Graphical law

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Abstract

We study Larousse Dictionnaire De Poche, Français Anglais / Anglais Français. We draw the natural logarithm of the number of French words, normalised, starting with a letter vs the natural logarithm of the rank of the letter, normalised. We conclude that the Dictionary can be characterised by BP(4,βH=0) i.e. a magnetisation curve for the Bethe-Peierls approximation of the Ising model with four nearest neighbours in absence of external magnetic field. H is external magnetic field, β is $\frac{1}{k_B T}$ where, T is temperature and k_B is the Boltzmann constant. We infer that the French, the Italian and the Spanish come in the same language group. Moreover, we put two dictionaries of philosophy and science on the same platform with that of the French. We surmise that philosophy owes more to the French speakers than science does.

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I. INTRODUCTION

Between the Atlantic and the Mediterranean, neighbouring Spain, Italy, Switzerland, Germany, Belgium, is situated the country France, rather the European France. The French is the people. The French is the language. The French language started off as a lingua franca, used to be used by very few in France. Slowly it replaced all the spoken languages to be established as the language in France. Here, we study a dictionary of this language, Larousse Dictionnaire De Poche, Français Anglais / Anglais Français, [1]. Studying the dictionary, putting the words in the graphical law analysis is the subject of this paper. To introduce the dictionary, [1], we reproduce few entries from the dictionary, [1], in the following.

ahuri means to be taken aback, auge means trough, avis means opinion, bahut means sideboard, balai means broom, banc means bench, b$\hat{a}$tir means to build, bave means dribble, bémol means flat, bijou means jewel, chacal means jackal, chope means tankard, cocher means coachman, comte means count, courant means current, Corée means Korea, cote means classification mark, écart means space, école means school, égal means equal, élire means to elect, Gallois means Welshman, gilet means waistcoat, hisser means to hoist, lait means milk, lame means blade, landau means pram, maman means mummy, martingale means half-belt or, winning system, messie means Messiah, motte means lump of earth, nana means girl, Noël means Christmas, panser means to dress, poche means pocket, poisson means fish, Poissons means Pisces, réne means rein, roche means rock, ruelle means lane, saliére means saltcellar, sang means blood, serrer means to grip, tare means defect, tétrad means tadpole, toupie means (spinning)top, triste means sad, va means courage, vigne means vine and so on.

In this article, we study magnetic field pattern behind this dictionary of the French,[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], respectively.

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 headwords of the dictionary of the French. language, [1]. In the section IV, we bring forth the similarity of the French and the jargon of Philosophy and Science respectively. Section V 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 long-range 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,[24], 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 $\triangle E$ of energy if we flip an up spin to down spin is, [25], $2\epsilon\gamma\bar{\sigma} + 2H$, where γ is the number of nearest neighbours of a spin. According to Boltzmann principle, $\frac{N_-}{N_+}$ equals $exp(-\frac{\triangle E}{k_B T})$, [26]. In the Bragg-Williams approximation,[27], $\bar{\sigma} = L$, considered in the thermal average sense. Consequently,

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

where, $c = \frac{H}{\gamma\epsilon}$, $T_c = \gamma\epsilon/k_B$, [28]. $\frac{T}{T_c}$ 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 [25]. 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, [24],[25],[26],[27],[28], due to Bethe-Peierls, [29], reduced magnetisation varies with reduced temperature, for γ neighbours, in absence of external magnetic field, as

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

$ln\frac{\gamma}{\gamma-2}$ 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.

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

In the Bethe-Peierls approximation scheme , [29], reduced magnetisation varies with reduced temperature, for γ neighbours, in presence of external magnetic field, as

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

Derivation of this formula Ala [29] 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,

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

BW	BW(c=0.01)	BP(4,βH = 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 .

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

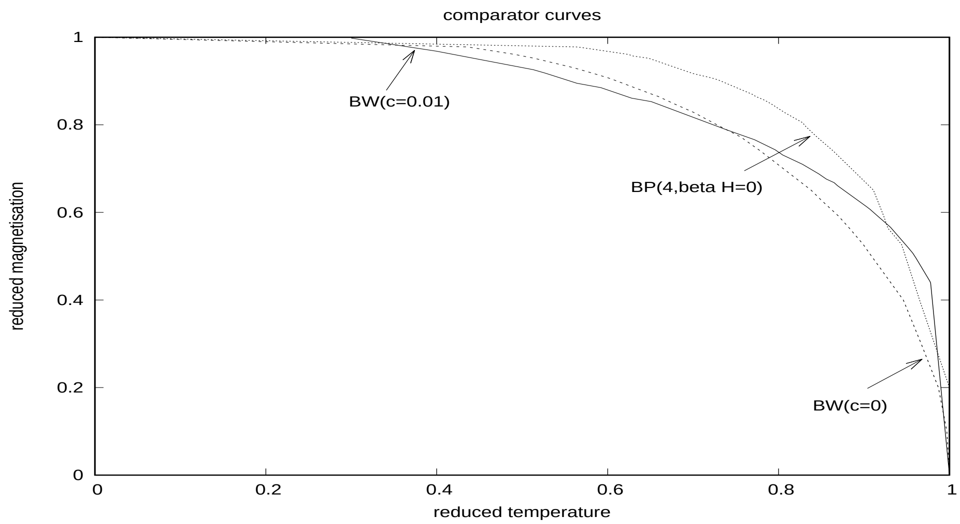

FIG. 1. Reduced magnetisation vs reduced temperature curves for Bragg-Williams approximation, in absence(dark) of and presence(inner in the top) of magnetic field, $c = \frac{H}{\gamma\epsilon} = 0.01$, and Bethe-Peierls approximation in absence of magnetic field, for four nearest neighbours (outer in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

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

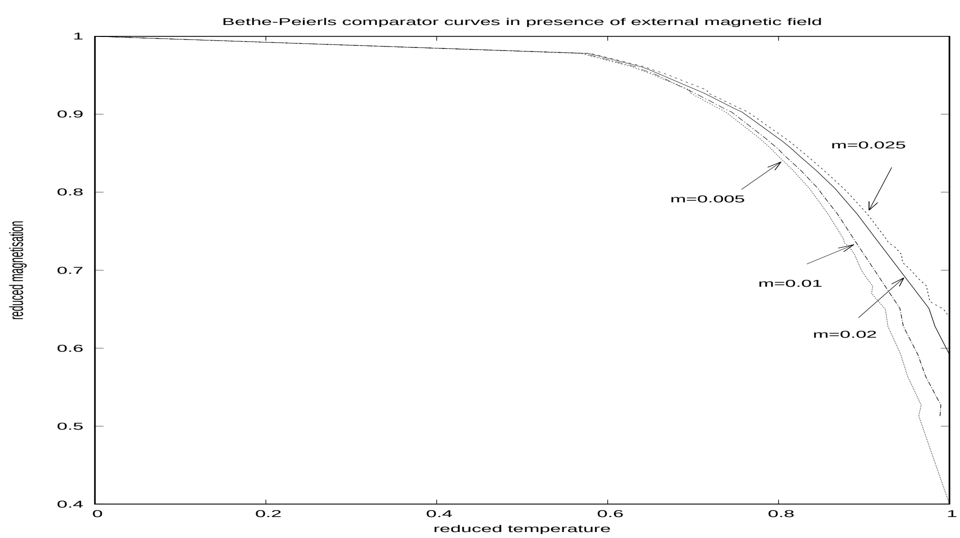

FIG. 2. Reduced magnetisation vs reduced temperature curves for Bethe-Peierls approximation in presence of little external magnetic fields, for four nearest neighbours, with $\beta H = 2m$.

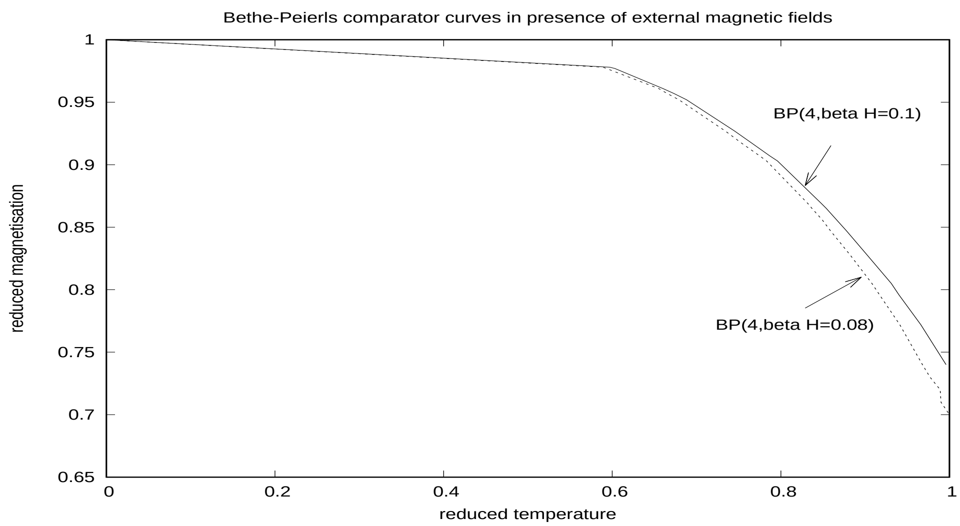

FIG. 3. Reduced magnetisation vs reduced temperature curves for Bethe-Peierls approximation in presence of little external magnetic fields, for four nearest neighbours, with $\beta H = 2m$.

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, [30], [31], [32], [29],

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

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

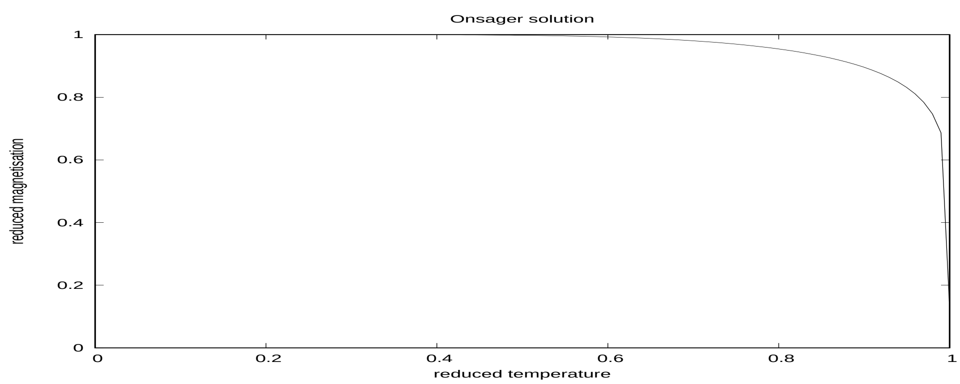

FIG. 4. Reduced magnetisation vs reduced temperature curves for exact solution of two dimensional Ising model, due to Onsager, in absence of external magnetic field

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1733	1025	2411	1361	1499	967	577	360	1094	201	52	570	1304	381	433	1905	129	1436	1452	963	95	568	24	5	14	25

TABLE III. French words

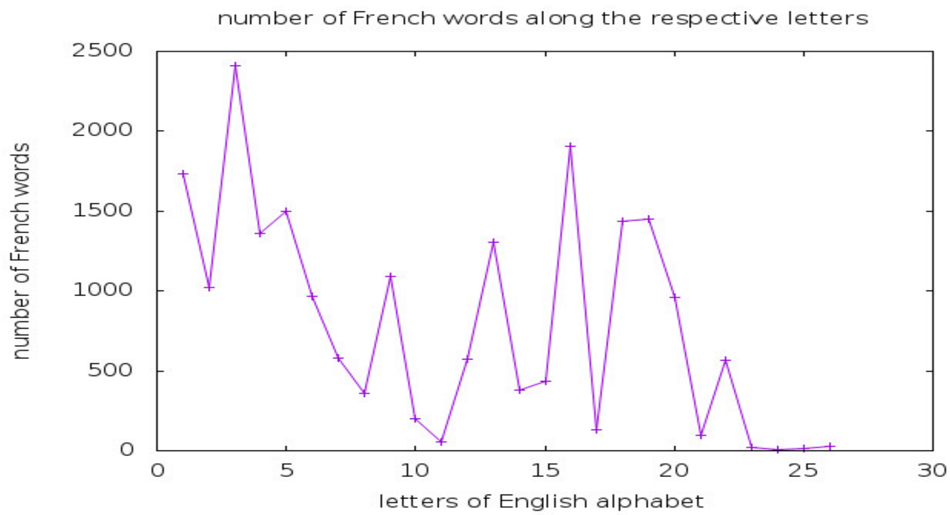

FIG. 5. The vertical axis is number of headwords of the French. language, [1], and the horizontal axis is the respective letters. Letters are represented by the sequence number in the English alphabet.

III. ANALYSIS OF WORDS OF THE FRENCH-ENGLISH DICTIONARY

The French language alphabet is that of the English language. We count all the words, [1], one by one from the beginning to the end, starting with different letters. Strictly speaking, we have counted all the headwords. The result is the table, III.

Highest number of words, two thousand four hundred eleven, starts with the letter C followed by words numbering one thousand nine hundred five beginning with P, one thousand seven hundred thirty three with the letter A etc. To visualise we plot the number of words against the respective letters, [1], in the figure fig.5. It is noticable of the lessness of the number of minor peaks compared to the number of major peaks. It was proposed in [23], that it may be reasonable to define naturalness of a language by the ratio of number of major peaks to the number of minor peaks. One may take major peaks as those with height up to the half of the height of the highest peak, in this case up to 1206, from above. The naturalness number of the French comes out to be 7/2.

k	lnk	lnk/lnk_{lim}	f	lnf	lnf/lnf_{max}	lnf/lnf_{nmax}	lnf/lnf_{nnmax}	lnf/lnf_{nnnmax}	lnf/$lnf_{nnnnmax}$
1	0	0	2411	7.788	1	Blank	Blank	Blank	Blank
2	0.69	0.209	1905	7.552	0.970	1	Blank	Blank	Blank
3	1.10	0.333	1733	7.458	0.958	0.988	1	Blank	Blank
4	1.39	0.421	1499	7.313	0.939	0.968	0.981	1	Blank
5	1.61	0.488	1452	7.281	0.935	0.964	0.976	0.996	1
6	1.79	0.542	1436	7.270	0.933	0.963	0.975	0.994	0.998
7	1.95	0.591	1361	7.216	0.927	0.956	0.968	0.987	0.991
8	2.08	0.630	1304	7.173	0.921	0.950	0.962	0.981	0.985
9	2.20	0.667	1094	6.998	0.899	0.927	0.938	0.957	0.961
10	2.30	0.697	1025	6.932	0.890	0.918	0.929	0.948	0.952
11	2.40	0.727	967	6.874	0.883	0.910	0.922	0.940	0.944
12	2.48	0.752	963	6.870	0.882	0.910	0.921	0.939	0.944
13	2.56	0.776	577	6.358	0.816	0.842	0.853	0.869	0.873
14	2.64	0.800	570	6.346	0.815	0.840	0.851	0.868	0.872
15	2.71	0.821	568	6.342	0.814	0.840	0.850	0.867	0.871
16	2.77	0.839	433	6.071	0.780	0.804	0.814	0.830	0.834
17	2.83	0.858	381	5.943	0.763	0.787	0.797	0.813	0.816
18	2.89	0.876	360	5.886	0.756	0.779	0.789	0.805	0.808
19	2.94	0.891	201	5.303	0.681	0.702	0.711	0.725	0.728
20	3.00	0.909	129	4.860	0.624	0.644	0.652	0.665	0.667
21	3.04	0.921	95	4.554	0.585	0.603	0.611	0.623	0.625
22	3.09	0.936	52	3.951	0.507	0.523	0.530	0.540	0.543
23	3.14	0.952	25	3.219	0.413	0.426	0.432	0.440	0.442
24	3.18	0.964	24	3.178	0.408	0.421	0.426	0.435	0.436
25	3.22	0.976	14	2.639	0.339	0.349	0.354	0.361	0.362
26	3.26	0.988	5	1.609	0.207	0.213	0.216	0.220	0.221
27	3.30	1	1	0	0	0	0	0	0

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

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 seven 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 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 $k=5$, resulting in figures up to fig.10.

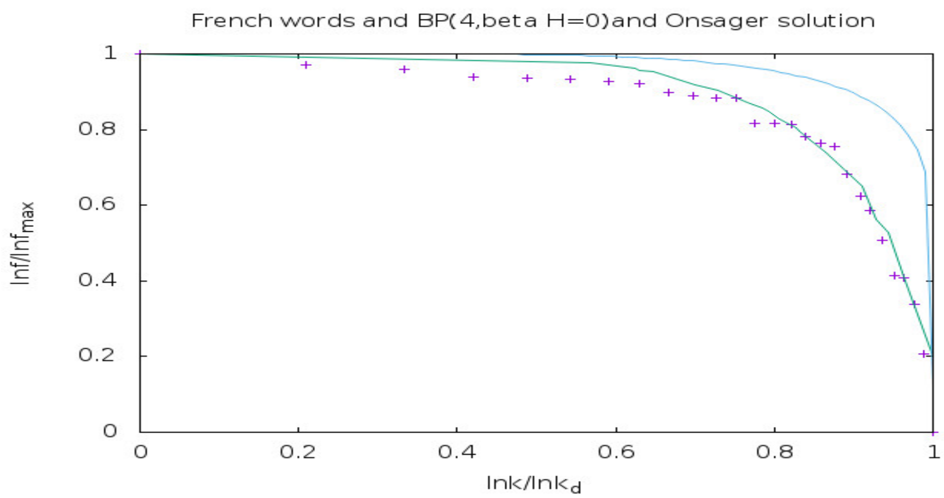

FIG. 6. The vertical axis is $\frac{lnf}{lnf_{max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the French language with the fit curve being the Bethe-Peierls curve, BP(4, $\beta H = 0$), with four nearest neighbours, in the absence of external magnetic field.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

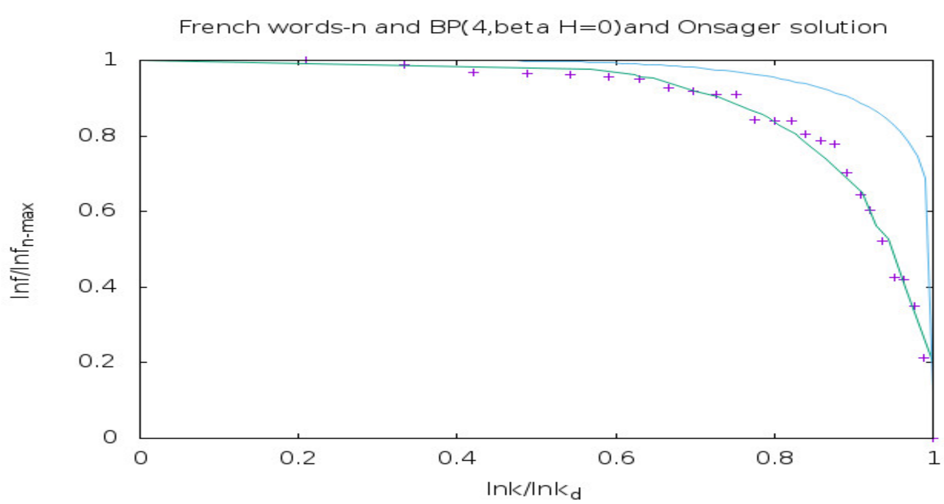

FIG. 7. The vertical axis is $\frac{lnf}{lnf_{next-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the French. language with the fit curve being the Bethe-Peierls curve, BP(4, $\beta H = 0$), with four nearest neighbours, in the absence of external magnetic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

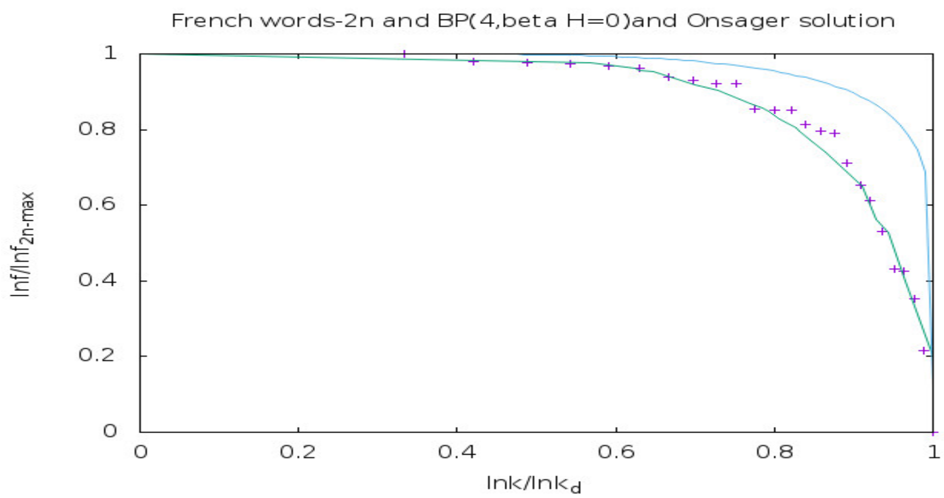

FIG. 8. The vertical axis is $\frac{lnf}{lnf_{nextnext-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the French. language with the fit curve being the Bethe-Peierls curve, BP(4, $\beta H = 0$), with four nearest neighbours, in the absence of external magnetic field. The uppermost curve is the Onsager solution.

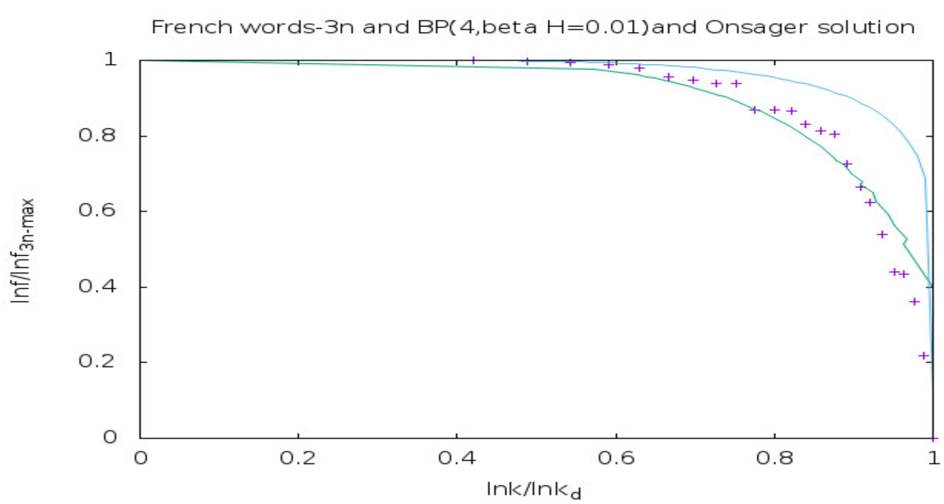

FIG. 9. The vertical axis is $\frac{lnf}{lnf_{nextnextnext-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the French language with the fit curve being the Bethe-Peierls curve, BP(4, $\beta H = 0.01$), with four nearest neighbours, in the presence of little magnetic field, m=0.005 or, $\beta H = 0.01$. The uppermost curve is the Onsager solution.

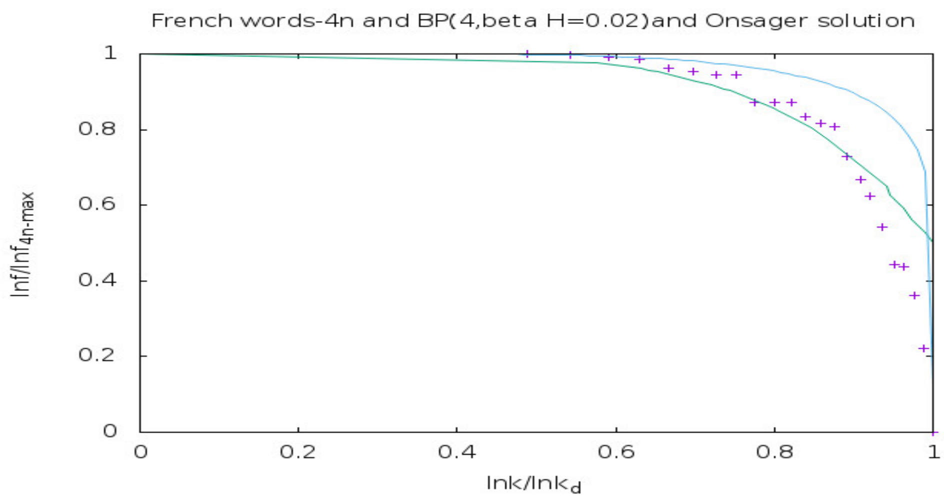

FIG. 10. The vertical axis is $\frac{lnf}{lnf_{nextnextnextnext-max}}$ and the horizontal axis is $\frac{lnk}{lnk_{lim}}$. The + points represent the words of the French. language with the fit curve being the Bethe-Peierls curve, BP(4, $\beta H = 0.02$), with four nearest neighbours, in the presence of little magnetic field, m=0.01 or, $\beta H = 0.02$. The uppermost curve is the Onsager solution.

A. conclusion

From the figures (fig.6-fig.10), we observe that there is a curve of magnetisation, behind the words of the French language, [1]. This is the magnetisation curve, BP(4,βH=0), in the Bethe-Peierls approximation in the presence of four nearest neighbours, in the absence of external magnetic field.

Moreover, the associated correspondence is,

$$\frac{lnf}{lnf_{n-max}} \longleftrightarrow \frac{M}{M_{max}},$$

$$lnk \longleftrightarrow T.$$

k corresponds to temperature in an exponential scale, [34].

On the top of it, as is imminent from the figures (fig.6-fig.10), words of the French language,[1] do not go over to the Onsager solution, on successive higher normalisations.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
321	140	344	206	194	128	91	126	262	28	34	125	211	105	73	301	25	127	293	146	35	60	51	5	9	16

TABLE V. Words of Philosophy

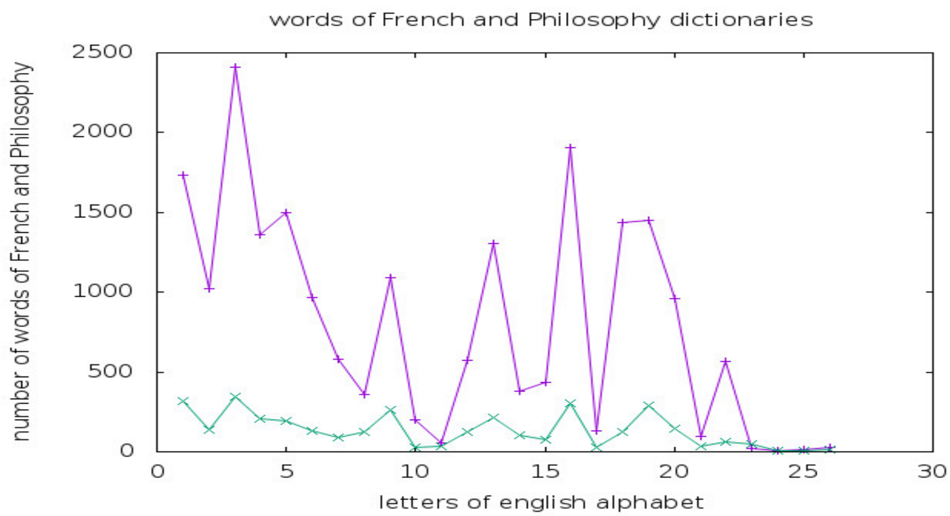

FIG. 11. The vertical axis is number of entries and the horizontal axis is the respective letters. Letters are represented by the sequence number in the English alphabet. The + points represent the French words, [1]. The × points represent the entries of a philosophy dictionary, [35].

IV. FRENCH, PHILOSOPHY, SCIENCE

A. French, Philosophy

We reproduce here, in the table V, the number of words counted in a dictionary of philosophy, [35], we have studied before, [3]. To bring the parallel in the forefront, we compare the the patterns of variations of number of entries along the English alphabet for both the dictionaries, French and Philosophy, in the figure, 11. To make the rise and fall clearer we multiply all the frequencies corresponding to letters of the philosophy dictionary by five and redo the plot in the figure, 12.

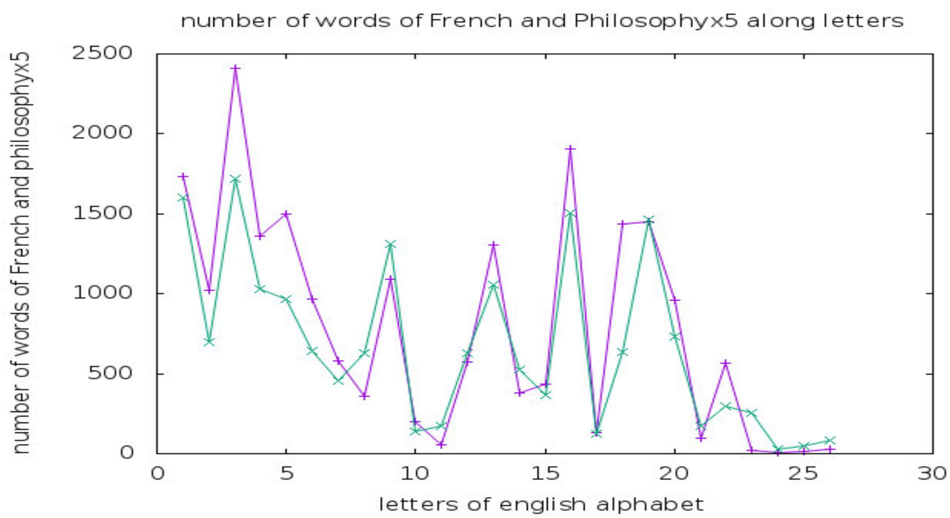

FIG. 12. Vertical axis is number of entries and horizontal axis is the respective letters. Letters are represented by the number in the alphabet or, dictionary sequence,[1]. The + points represent the French words. The $\times$ points represent the entries of philosophy dictionary, [35], once each frequency gets multiplied by five.

We conclude that the words of the French, [1], and the entries of philosophy dictionary, [35], are rising and falling in unison along the letters of the English alphabet nearly in all the places.

From the graphical law perspective, We have observed that there is a curve of magnetisation, behind the words of the French language,[1]. This is magnetisation curve, BP(4,βH=0), in the Bethe-Peierls approximation in the absence of external magnetic field. This is also the case with the dictionary of philosophy, [3] i.e. underlying magnetisation curve is BP(4,βH=0). Curves of $\frac{lnf}{lnf_{max}}$, $\frac{lnf}{lnf_{n-max}}$ and $\frac{lnf}{lnf_{2n-max}}$ against $\frac{lnk}{lnk_{lim}}$ are, in both the cases, for the French and the Philosophy, [3], matched by BP(4,βH=0).

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
877	573	1157	497	551	367	400	464	367	45	108	391	655	292	244	955	74	394	943	478	81	185	122	26	19	47

TABLE VI. Words of dictionary of Science

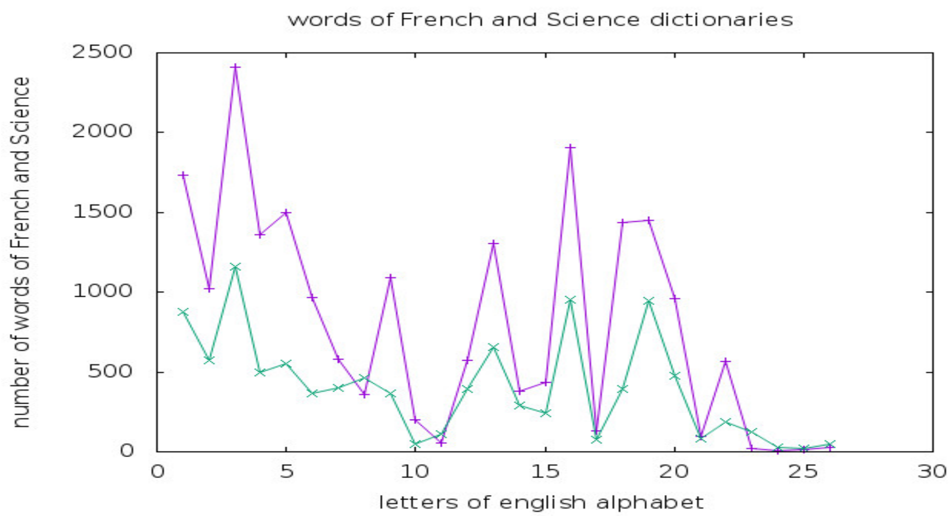

FIG. 13. The vertical axis is number of entries and the horizontal axis is the respective letters. Letters are represented by the sequence number in the English alphabet. The + points represent the French words. The × points represent the entries of a science dictionary, [36].

B. French, Science

We have counted, [3], all the entries of Dictionary of scince, [36], one by one from the beginning to the end, starting with different letters.The result is the table, VI. To bring the parallel in the forefront, we compare the the patterns of variations of number of entries along the English alphabet for both the dictionaries, French and Science, in the figure, 13. We conclude that the words of the French, [1], and the entries of science, [36], are rising and falling in unison along the letters of the English alphabet in all places, barring few. In one place maximum contradicts minimum. Moreover, the entries of dictionary of science, [7] underlies the magnetisation curve BP(4,βH=0.01). Hence, we surmise that philosophy owes more to the French speakers than science does.

V. ACKNOWLEDGMENT

We have used gnuplot for plotting the figures in this paper. We have benefited from reading related pages of Wikipedia and Wikitravel.

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