

Origin of War and Way to Eternal Peace

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Research Article

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ABSTRACT

This study is concerned with the origin of war and way to eternal peace in the world. The origin of war is our fighting instinct accompanying with any weapon including iron bar and/or gun, and as long as it exists, in principle it is impossible for human society to avoid the war. In other words, since war is caused by fighting instinct that exists in the hearts of human beings, the only way to root out the war among us is to abandon all weapons at all. It is inferred that this is an ultimate way to eternal peace in our society and world as well.

INTRODUCTION

Nothing can perhaps prevent from breaking out firing war in our society or world, because we human beings possess 'fighting instinct', the ultimate origin and some weapons such as hostile feeling and words, knife, gun, missile and or atomic bomb playing a vital role in its driving force. In general, these weapons have been used for defending each of the nations, and at the same time, they have been often adapted to establish stronger ones [1-5]. Because anyone possesses passions in Buddhist and original sins in Christian, it is essential for us all to create the peace resiliently by overcoming the great difficulty with every possible effort. Therefore, human history might be even considered as a long succession of uncountable number of wars among people since the first appearance of our ancestor on the Earth, viz. about four billion and six hundred million years ago [6-10]. Modelling war phenomena have been extensively explored by using differential equations and/or informatics have introduced several methods of modellings with differential equation to solve social problems such as management life science, infectious disease economics and dynamics marketing pollution foreign politics together with warfare. Scientific modelling and simulation in warfare started in the paper entitled "Aircraft in Warfare" by and since then this is still an active research field [11-15].

Illustrates a typical example for the history of defense budget in France, Russia, German and Austria-Hungary from 1909 to 1913, which is only one year before the outbreak of the World War 1 in 1914. Before the war, France and Russia were one group, while Germany and Austria-Hungary were another group. However, UK and Italy were neutral until the outbreak, but then these two countries joined in the former group eventually. Referring to Table 1, it is evident that the amount of the budget for each of the countries is increasing for the four years before the World War 1 continuously, for the two groups of countries were conflicting against each other. At the stage in 1913, the former group consisting of France and Russia got already some advantage in the military force against the latter group consisting of Germany and Austria-Hungary, though the balance of power between the two groups had changed dramatically by the new participation of UK and Italy to the former group in 1914 (Table 1)^[16-18].

Table 1. History of defense budget in France, Russia, German and Austria-Hungary from 1909 to 1913.

Country	Year				
	1909	1910	1911	1912	1913
France	48.6	50.9	57.1	63.2	74.7
Russia	66.7	68.5	70.7	81.8	92
Germany	63.1	62	62.5	68.2	95.4
Austria	-	-	-	-	-
Hungary	20.8	23.4	24.6	25.5	26.9
Total	199.2	204.8	214.9	238.7	289

Main purpose of the present paper is to illustrate mathematically how to break out the war, if any effort towards the disarmament of weapons is not done. In addition to this, some ideas to mitigate war have been proposed. On the basis of the theoretical results, it has been argued on the way to eternal peace in the world ^[19-21].

MATERIALS AND METHODS

Theoretical

In this section, we describe a mathematical model of bilateral conflict. Every country is trying to defend itself against the other, and each assumes the possibility of an attack from another country. To formulate a mathematical model of military expansion, x (t) and y (t) are first defined as the force potential of countries A and B, respectively. Here, the force potential is defined as the armament level, and is dependent of the time. Let us

assume that the time derivative of x is proportional to y. That is, suppose $\frac{dx}{dt} = K \cdot y$, where k is a constant. In

addition, it is assumed that $\frac{dx}{dt}$ has a certain inhibitory-effect on the force potential such as $ky - \alpha x$, and other force potential needs to be added by a constant term g to represent the anxiety caused by the potential threat that Country A possesses against its neighbor Country B. Consequently

$$\frac{dx}{dt} = Ky - \alpha x + g \dots \dots \dots (1)$$

Similarly to x, we obtain with respect to y,

$$\frac{dy}{dt} = lx - \beta y + h \dots \dots \dots (2)$$

Where l , β and h are constants, respectively.

The following conclusions can be drawn immediately from the above mathematical model. If there is no anxiety about potential threats between the two countries, then in this case since $k = l = \alpha = \beta = g = h = 0$,

$$\frac{dx}{dt} = \frac{dy}{dt} = 0$$

, Nonetheless, the both strength potentials for countries A and B will take certain values of constant, respectively. However, in this case, even if these values are positive, a peace may be maintained between the two countries: Typical example exists on the U.S.A.-Canada border since 1817.

When both countries are unarmed, and thus $k = l = \alpha = \beta = 0$, (1) and (2) become as follows, respectively.

$$\frac{dx}{dt} = g \dots \dots \dots (3)$$

$$\frac{dy}{dt} = h \dots \dots \dots (4)$$

Thus, if both A and B have a potential threat or distrust of each other, then the values of g and h are both positive, so x and y both continue to increase.

Finally, in the case of an arms race between the two countries, such as Japan and North Korea, even $\alpha = \beta = g = h$ in (1) and (2) are expressed as follows:

$$\frac{dx}{dy} = ky \dots \dots \dots (5)$$

$$\frac{dy}{dt} = lx \dots \dots \dots (6)$$

Now, from the above two expressions, (5) and (6), we have

$$\frac{dx^2}{dt^2} = \frac{kdy}{dt} = k lx \dots \dots \dots (7)$$

If we solve this equation, it becomes as follows.

$$x = A \exp[(kl)^{1/2}t] + B \exp[-(kl)^{1/2}t] \dots \dots \dots (8)$$

After substituting (8) in (5), we solve for y as follows.

$$y = (l/k)^{1/2} \{ A \exp[(kl)^{1/2}t] + B \exp[-(kl)^{1/2}t] \} \dots \dots \dots (9)$$

The above results, (8) and (9), show that if A is positive, then the force potentials x and y of the two countries, A and B, respectively, approaches to infinity with time. In other words, it clearly suggests that A and B will eventually reach at a state of war. Of course, this conclusion holds that relation among citizens in U. S. A., a gun society, ultimately ends up in a state of struggle among people with guns.

On the other hand, in (8) and (9), if A is 0, the force potentials x and y of A and B, respectively, are both zero, and a peace between the two countries may be maintained by an exquisite military balance. Furthermore, if A takes a negative value, it indicates that the two countries, A and B's force potentials x and y , respectively, asymptotically

move toward minus infinity with time. In this case, it may correspond to the result of ideal disarmament negotiations between the two countries. Note that in the case of $a \leq 0$, it can be realized as a result of the steady and sure progress of disarmament negotiation at international organizations such as the United Nations and major powers, and it will be achieved only through sincere efforts by countries around the world toward incessant peace building effort.

In brief, the origin of war is our fighting instinct and weapons are its driving force, and as long as they exist, it is impossible in principle for human society to root out the war. In other words, since war is caused by fighting instinct that exists in the hearts of human beings, the only way to avoid war is for everyone to abandon all their weapons at all.

Let us be back to the original question based on (1) and (2) again: Firstly, the one equilibrium point may be

$$\frac{dx}{dt} = \frac{dy}{dt} = 0$$

obtained by setting $\frac{dx}{dt} = \frac{dy}{dt} = 0$, and then solving the remained two equations with respect to x, and y accordingly the coordinate of the equilibrium point is found to be

$$x_0 = \frac{(Kh + g\beta)}{(\alpha\beta - kl)}, y_0 = \frac{(\alpha h + gl)}{(\alpha\beta - kl)} \dots\dots\dots(10)$$

Where $(\alpha\beta - kl) \neq 0$.

Now let us enquire the stability of this point, and so put

$$x = x_0 + u, \quad y = y_0 + v \dots\dots\dots(11)$$

Where u and v are infinitesimal deviation from x_0 and y_0 , respectively. After substituting (11) in (1) and (2), and then by arranging them, we obtain

$$\frac{du}{dt} = -\alpha u + kv \dots\dots\dots(12)$$

$$\frac{dv}{dt} = lu - \beta v \dots\dots\dots(13)$$

As trial solutions, let us assume

$$u = Ae^{rt}, \quad v = Be^{rt} \dots\dots\dots(14)$$

And substituting (14) in (12) and (13), respectively, we obtain

$$\frac{A}{B} = \frac{k}{(r + \alpha)}, \quad \frac{A}{B} = \frac{(r + \beta)}{l}$$

Thus,

$$\frac{k}{(r + \alpha)} = \frac{(r + \beta)}{l}$$

Or

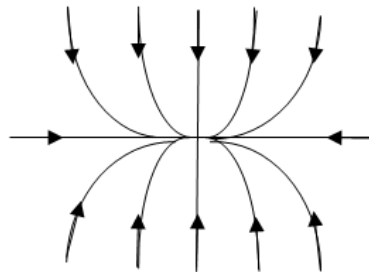
$$r^2 + (\alpha + \beta)r + \alpha\beta - kl = 0 \dots\dots\dots(15)$$

Solving (15) with respect to r, we have

$$r = -\frac{(\alpha + \beta)}{2} \pm \frac{[(\alpha + \beta)^2 - 4(\alpha\beta - kl)]^{1/2}}{2} \dots\dots\dots(16)$$

It may be evident that two roots are real. Moreover, when $(\alpha\beta - kl) > 0$, both of the roots, r_1 and r_2 are negative, so that they are stable as depicted in Figure 1.

Figure 1. Asymptotically stable knotted point $r_1 < r_2 < 0$.

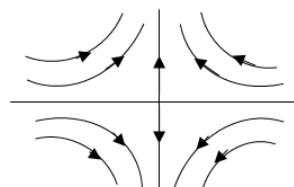


On the other hand, if $(\alpha\beta - kl) < 0$, one root is positive, while the other root negative. This results in the unstable saddle point, as depicted in Figure 2.

The above results suggest us that war would depend on the combination among four values, α, β, k and l in such a way whether $(\alpha\beta - kl)$ is positive or negative in (1) and (2), but it is independent of the two constants g and h . Referring (1) and (2) again, when inhibitory effect due to α, β , and $\alpha\beta$ is dominant over the armament one due to k, l and kl , $(\alpha\beta - kl)$ becomes positive, and so the equilibrium points (x_0, y_0) is no more than a stable knotted point, as depicted in Figure1. This clearly infers that to maintain the peace between two countries A and B, or say Russia and Ukraine, both countries are required to increase their inhibitory effects, respectively. Note that the inhibitory effect on the war intervene into the power balance between two countries as the form of multiplication of the two constants α and β expressing inhibitory effect for two countries, respectively.

On the other hand, when the armament effect is dominant over the inhibitory effect, since $(\alpha\beta - kl)$ becomes negative, so the equilibrium point becomes unstable saddle point. This results in war between two nations.

Figure 2. Unstable saddle point $r_1 < 0 < r_2$.



RESULTS AND DISCUSSION

Severe fighting between Russia and Ukraine is continuing. However, the war itself is not a peculiar event, but is normal, for fighting instinct exists in everyone's mind always since the dawn of history. Therefore, because the origin of war is the fighting instinct of human beings, a peaceful world might not be realized as long as man exists, even though this situation is rather contradictive. However, if peace is redefined as a state in which there is no armed struggle among nations, this is not necessarily impossible.

Theoretically, it is possible to at least eradicate armed struggle in human society unless any part of the body, including our hands and/or feet, is used in the struggle against others. On the other hand, as long as each country possesses its own weapons, there always exists a risk that it will develop into a tragic armed struggle like in Ukraine between Russia and Ukraine. It is hypothesized here that armed people (a relatively large number of Americans carry guns, but not only Americans, but also Japanese police officers, gangsters), and the military force of each of the countries are driving the war, and thus the endless armament race is a natural state in this world. As a Japanese philosopher in Meiji era, Chomin Nakae (1847~1901) pointed out, the military buildup of one neighboring country A provokes that of country B on the other, which in turn leads to the additional military buildup of country A, and thus the chain of armament expansion between two countries A and B will never stop. It is fate that this chain will be expanded and reproduced by fostering suspicion among nations, and eventually develops into an all-out war in which both countries use the latest weapons. This process from peace to war between neighbors has been clearly explained by a simple mathematical model in the previous section. So, the question is whether there is any frame to cut out the unwanted fate that leads to such a nightmarish war? In fact, it is suggested in the previous section that disarmament is the only way to save human beings from the war, and the final conclusion is to accomplish the complete renunciation of the possession of weapons. It was Japan in South-East Asia that was defeated in World War II, was imposed a peace constitution by the Allies Force, and was forced to abandon all of the weapons and troops, and it was Costa Rica in Central America that voluntarily stipulated the renunciation of the military force by the constitution with reference to this peace constitution of Japan. From the above considerations, it is clear that the reduction or abandonment of military force is always accompanied by the danger of aggression by neighboring countries unless it is kept pace with neighboring countries. In fact, both Japan and Costa Rica are currently at risk of such aggression from their neighbors. However, the abandonment of military force is the only and final choice for the survival of human beings, and thus all of the countries in the world should move towards such a noble and glorious goal. Already, as may be clear from the above discussions, the arguments advocated by Japan's foolish politicians at present, such as nuclear sharing and the possession of the ability to attack potential enemy bases, are foolish and outrageous argument that goes completely against noble actions that we, human beings should work for world peace. On the other hand, increase of military force must result in the destruction of peace among neighboring countries, China, Russia, North Korea, etc. unnecessarily.

CONCLUSION

In this section, new findings and insights obtained through the present study have been summarized. It is realized that the origin of war is our fighting instinct, and weapons including arms and/or feet are its driving force, and as long as these exist, in principle it is impossible for human society to root out war. In other words, since war is caused by fighting instinct that exists in the hearts of every human, the only way to avoid it is to abandon all weapons at all. The reduction or abandonment of military force is always accompanied by danger of aggression by

neighboring countries unless it is kept pace with them. It is concluded that the abandonment of military force is the final choice for the survival of human beings, and thus all of countries in the world should move towards such a noble and glorious goal. The nuclear sharing and/or possession of the ability to attack military bases of neighboring countries are foolish and outrageous argument that goes completely against noble action that we, human beings should work for the world peace.

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