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A Dialectical Evolutionary Theory of Civilizations, Empires, and Wars

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A DIALECTICAL EVOLUTIONARY THEORY OF CIVILIZATIONS, EMPIRES, AND WARS

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A "dialectical evolutionary theory" tries to relate the concepts of civilization, empire, and war to one another in such a way that their interaction results in positive feedback loops leading them ever upward and onward in a spiraling motion, unless and until it leads them in the opposite direction by way of negative feedback loops which reverse the direction of the spiral.* The theory is especially interested in what determines which direction these loops take, but this special part of the theory will receive more attention in future research. This article will concentrate on the more general relations between civilizations, empires, and wars.

In order to establish the relations between civilizations, empires, and wars, we have to find ways of measuring these variables. Then it will be simple enough to correlate these measures with one another, and to find out how much they vary together, if at all. We shall begin with civilizations, and then go on to empires and wars.

Measuring Civilizations

Both Kroeber (1944) and Sorokin (1941) provided a means of measuring civilization. Their methods were similar in that they both counted the number of (mostly) men who had engaged in civilized or cultural activities to such an extent as to get themselves recognized in encyclopedias and textbooks for the quality of their accomplishments. Kroeber was more selective than Sorokin, counting only "geniuses," which he defined as "superior individuals" (pp. 7, 8), whose superiority was established by the consen-

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sus of encyclopedia and textbook authors (p. 23). Their activities included philosophy, science, grammar (philology), sculpture, painting, drama, and literature. These activities were pursued from 4000 BC to 1900 AD in five civilizations: Middle East (Egypt, Mesopotamia, and Islam), Far East (China and Japan), South Asia (mainly India), Greece and Rome, and the West (Europe).

Kroeber did not actually count these individuals, but he did identify them, making it possible to get a rough count for various regions at various times. I sorted Kroeber's seven cultural activities over the 49 centuries from 3000 BC to 1900 AD, then logged them to correct for skewness, and then correlated them with one another. All of the correlations were significant at the .01 level of confidence, ranging from .43 between grammar and drama to .89 between painting and sculpture. They were all significantly correlated with time (as measured by centuries) from .64 (grammar) to .92 (literature), so that the number of geniuses in the world (as represented by the geographical regions of Europe, Far East, India, and Middle East) were increasing exponentially over these 49 centuries. When this correlation matrix was factor analyzed, a single factor emerged: Literature (.95), Century (.92), Science (.92), Sculpture (.89), Painting (.86), Philosophy (.85), Drama (.80), and Grammar (.75). Factor scores could be generated to provide a measure of world civilization, but the simple sum of the seven activities (as measured by the number of geniuses) will be quite adequate for the time being.

This sum was used to measure the rise and fall of civilizations in the four geographical regions of the world: Europe, Far East (China and Japan), India, and the Middle East (Egypt, Mesopotamia, and Islam). These four (logged) regions were significantly correlated with one another over these 49 centuries, except for Europe with the Middle East. They were all significantly correlated with time, but the Middle Eastern correlation was significant only at the .10 level of confidence. When this correlation matrix was factor analyzed, two factors were generated, the first of which was: Far East (.98), Century (.96), India (.88), Europe (.84), and the Middle East (.29). The low loading of the Middle East on this factor shows that its pattern of rising and falling civilized activities (geniuses) was not so correlated with time (centuries) as the other three regions were, as shown in Table 1, where the Middle East provided the overwhelming majority of

TABLE 1
Kroeber's (1944) Geniuses

Century	*Europe*	*FarEast*	*India*	*MidEast*	*NonEuro*	*Total*	*Eur%*
—30	0	0	0	4	4	4	0%
—29	0	0	0	0	0	0	
—28	0	0	0	3	3	3	0%
—27	0	0	0	4	4	4	0%
—26	0	0	0	2	2	2	0%
—25	0	0	0	4	4	4	0%
—24	0	0	0	0	0	0	
—23	0	0	0	0	0	0	
—22	0	0	0	0	0	0	
—21	0	0	0	0	0	0	
—20	0	0	0	9	9	9	0%
—19	0	0	0	6	6	6	0%
—18	0	0	0	6	6	6	0%
—17	1	0	0	2	2	3	33%
—16	1	0	0	2	2	3	33%
—15	1	0	0	2	2	3	33%
—14	1	0	0	2	2	3	33%
—13	0	0	0	9	9	9	0%
—12	0	0	0	1	1	1	0%
—11	0	0	0	0	0	0	
—10	0	0	0	2	2	2	0%
—9	2	0	0	3	3	5	40%
—8	7	0	0	2	2	9	78%
—7	14	1	0	6	7	21	67%
—6	39	3	5	3	11	50	78%
—5	108	9	1	2	12	120	90%
—4	100	11	3	0	14	114	88%
—3	35	10	4	0	14	49	71%
—2	45	15	5	0	20	65	69%
—1	52	6	3	0	9	61	85%
1	59	9	2	0	11	70	84%
2	49	21	13	0	34	83	59%
3	15	18	5	0	23	38	39%
4	25	15	11	0	26	51	49%
5	15	12	19	0	31	46	33%
6	5	19	10	15	44	49	10%
7	1	48	19	8	75	76	1%
8	2	43	11	32	86	88	2%
9	6	27	14	52	93	99	6%
10	9	24	7	77	108	117	8%
11	21	50	6	61	117	138	15%
12	65	34	12	42	88	153	42%
13	121	33	4	29	66	187	65%

Century	*Europe*	*FarEast*	*India*	*MidEast*	*NonEuro*	*Total*	*Euro%*
14	80	14	3	12	29	109	73%
15	194	18	8	5	31	125	86%
16	391	23	4	6	33	424	92%
17	360	47	5	0	52	412	87%
18	377	56	1	0	57	434	87%
19	767	27	1	0	28	795	96%
Sum	2968	593	167	413	1182	4150	72%

geniuses in the first two millennia from 3000 to 800 BC, when Europe took over for the most part until 500 AD, followed by the Far East for a few centuries. Then the Middle East prevailed for a few more centuries, until Europe took over again in the 12th century.

When the three Non-European regions were added together, the sum of their geniuses was correlated .66 with the European sum, so that both Europe and the rest of the world (Asia) were significantly similar in the historical distribution of their geniuses. When all four regions were added together (resulting in the same sum as the seven civilized activities), this provided a measure of world civilization, which is shown in the next to the last column of Table 1. Although the European and Non-European *pattern* of civilized activities was similar, the same cannot be said about the *level* of their activities, where Europe produced more than twice as many geniuses as the rest of the civilized world during these 49 centuries; 72% of the total, as shown in the last column of the last row in Table 1.

Sorokin (1941, pp. 328-329) also provided a measure of cultural values going back to 4000 BC, but the data were rather sketchy until the 11th century BC, and they were more Eurocentric than Kroeber's geniuses, since Europeans constituted 85% of the total. These data represented historical persons who were mentioned in the 9th edition of the *Encyclopedia Britannica,* which was published 1875-1889, as having made a notable contribution to one or more fields of culture, including statesmanship, philosophy, religion, literature, fine arts, miscellaneous, scholarship, science, music, and business. John V. Boldyreff gathered these data for his doctor's dissertation, but Sorokin is the most accessible reference for them. Each person was weighted by the number of lines

used to describe his (mostly male) accomplishments. Only one figure was provided for the 4th millennium BC, another one for the 3rd millennium BC, and another one for the 15th century BC. After that, data were available for every 50 years from 1050 BC to 1849 AD. Sorokin provided arithmetic averages of the 10 cultural areas previously listed, noting that "almost all ten series move more or less alike and in a similar direction, parallel" (1941, p. 352). In this respect Sorokin's ten cultural activities were similar to Kroeber's seven civilized activities: they all tended to rise and fall together.

However, as already noted, the historical persons in the 9th edition of the *Encyclopedia Britannica* were largely Europeans, so that the use of them to represent *world* civilization may be questionable. To test the validity of this procedure, I correlated the European scores (1937, Vol. 3, p. 516) with the Non-European scores (total scores minus European scores) over the 49 centuries from 3000 BC to 1900 AD. The correlation, when both scores were logged to correct for skewness, was .90, which showed that, regardless of the difference in *level*, the *pattern* of European scores was quite similar to that of Non-European scores over these centuries, and consequently that this measure of world civilization was quite adequate for the purpose of measuring the relative civilization of these 49 centuries, although it might be inadequate for comparing European and Non-European civilizations within any century or for all centuries taken together. The correlation between centuries and the total (logged) score was .92, showing a significant and exponential increase in the number of these historical persons over these centuries.

When Sorokin's historical persons were logged and correlated with Kroeber's (logged) geniuses, the correlation was .93, suggesting that either Kroeber's geniuses or Sorokin's historical persons could be used as a measure of world civilization. Kroeber's geniuses will be used in this article because they are less Eurocentric, and they provide a further breakdown of Non-European civilizations which is not available in Sorokin's data.

Sorokin also provided a count of scientific discoveries and technological inventions (1937, Vol. 2, Ch. 3), which could be used as a measure of European and world civilization, since they were correlated .89 with Sorokin's world civilization and .91 with Sorokin's European civilization. However, they will not be used in this

article, because no breakdown outside of European civilization is possible with these data.

Naroll et al (1971), like Kroeber and Sorokin, "concluded that the counting of creative individuals was the most useful measure of the total creativity of the society to which they belonged at the period of time in which they lived" (p. 182). Naroll et al used these counts of Kroeber's data to measure a civilization's creativity. I assume that these counts may be used as a measure of civilization itself. This assumption seems to be implied in the work of Kroeber and Sorokin. Kroeber's problem was to study "high cultural developments" (1944, p. 6). Individual geniuses were used as an index of these cultural developments. The curves of "different activities of [Egyptian] culture" (p. 240) were taken as rough indicators of "Egyptian civilization as a whole" (p. 241). Likewise, the Assyrian history of sculpture was "also the outline of the history of higher civilization in accentuated form" (p. 311). Sorokin refered to the weighted number of his historical persons as an indicator of the "total creativeness of cultural values" (1941, p. 323), and again as an indicator of "cultural creativeness" (p. 325), so that Naroll's interpretation of Kroeber's data came closer to that of Sorokin than to that of Kroeber. My interpretation of Kroeber's data will follow that of Kroeber to the effect that the number of individual geniuses provide a measure of the height of civilization itself. It is quite possible that Naroll and Sorokin assumed implicitly that creativeness and civilization were synonymous terms or, at least, indicative of each other.

Measuring Empires

Taagepera's (1978) imperial sizes will be used in this article as a measure of empires, by which Taagepera meant "any large sovereign political entity whose components are not sovereign" (p. 113). He measured empires in terms of square megameters, each one of which is equivalent to 386,000 square miles. Empires did not amount to much prior to 600 BC, when the Medes and the Persians introduced a degree of hierarchical bureaucracy (satrapy) unknown before in human history. Even from 500 BC to 1500 AD, the "progress" in imperial sizes was not spectacular. Then there was another great leap into the modern period of history following 1600 AD, which Taagepera attributed to the

European industrial-communication revolution. History, however, clearly shows the rise and fall of civilizations and empires, not only once, but several times. Although the global picture is an ever upward spiral, so far, the regional pictures are full of falls and rises, as shown in Table 2.

Table 2 shows the rises and falls in eight regional empires, whose imperial sizes are summed in the last column, providing a measure of how much of the earth came under imperial control century by century. This sum shows that empires occupied very little of the earth up to and including the 8th century BC. Imperial areas did not cover 1% of the earth's surface until the 16th century BC. In the 15th to 12th centuries BC, all of the imperial areas together constituted no more than 2% of the earth's surface, most of which was controlled by China and Egypt, after which imperial areas returned to the 1% level until the 7th century BC.

In the 6th century BC, less than 6% of the earth's surface was covered with empires. This grew to 95% in the 20th century AD. While some 94% of the earth was occupied by gatherers and hunters, farmers and herders, in 600 BC, there was only 5% of the earth so occupied in the 20th century AD, and virtually 0% today. Self-sufficient primitive tribes and villages were clearly no match for civilized communities with their civilized ways of conquest, domination, and exploitation. It took more than 2500 years to wipe them out, but we did it, not to mention wiping one another out from time to time in the process.

Measuring Wars

The most important measure of war would be the number of deaths caused by it. However, these data are not available much before the modern period. However, I found a significant correlation of .70** between battles per war and deaths per war during the modern period, and I also found a significant correlation of .91** between battles per half-century and war deaths per half-century during the modern period (Eckhardt, 1990), suggesting that battles may be used as a measure of war's intensity in the absence of more positive data on war deaths. Since then, I have found significant correlations between several sets of battle and war frequencies, on the one hand, and two sets of war casualties and deaths, on the other, both over the centuries from 1500 BC to

TABLE 2
Taagepera's (1978) Imperial Sizes

Century	*Egypt*	*Meso*	*India*	*China*	*Turkey*	*Persia*	*CentAs*	*Europe*	*World*
—30	0.15	0.00							0.15
—29	0.20	0.00							0.20
—28	0.25	0.01							0.26
—27	0.30	0.02							0.32
—26	0.35	0.02							0.37
—25	0.40	0.03							0.43
—24	0.40	0.05	0.05						0.50
—23	0.20	0.60	0.10						0.90
—22	0.10	0.20	0.10						0.40
—21	0.10	0.03	0.15						0.28
—20	0.20	0.10	0.20						0.50
—19	0.50		0.20	0.10					0.80
—18	0.50		0.30	0.45					1.25
—17	0.25	0.45		0.40					1.10
—16	0.60	0.20		0.40	0.10				1.35
—15	1.00	0.40		0.50	0.15				2.05
—14	0.90	0.40		0.65	0.20	0.10			2.25
—13	1.00	0.25		0.90	0.45	0.10			2.70
—12	0.75	0.20		1.10	0.40	0.20			2.65
—11	0.60	0.35		0.55	0.10				1.60
—10	0.40	0.15		0.45					1.00
—9	0.20	0.60		0.35					1.15
—8		0.70		0.25	0.20				1.15
—7	0.50	1.30			0.15				3.10

Century	*Egypt*	*Meso*	*India*	*China*	*Turkey*	*Persia*	*CentAs*	*Europe*	*World*
—6	0.65	0.60	0.50	0.10	0.50	5.50			7.85
—5		0.15	0.30	0.30		5.50			6.25
—4		0.20	1.00	0.50		4.00			5.70
—3		1.20	3.50	1.30		5.20	0.50	0.15	11.85
—2			3.00	2.50		3.30	5.70	0.65	15.15
—1			1.50	6.20		3.20	2.00	3.50	16.40
1			3.50	6.50		2.50	1.50	4.40	18.40
2			1.20	5.70		2.50		4.40	13.80
3			1.30	5.50		3.50		4.40	14.70
4				2.80		3.50		7.40	13.70
5			1.70	5.80		3.50	1.00	5.90	17.90
6				6.40	1.30	3.40	7.20	2.70	21.00
7		9.00		5.20			2.80	1.00	18.00
8		11.00		5.20			7.50	1.00	24.70
9		4.50	1.00	3.00	1.00	2.00	4.70	2.30	18.50
10		3.10		3.00	1.00	2.30	5.00	2.60	17.00
11		2.50		3.00	4.00		5.00	2.50	17.00
12		3.30		4.30			2.50		10.10
13		3.00	2.50	2.00			25.00		32.70
14		2.00	2.80	15.00		4.00	8.00		31.80
15		3.00		6.50	1.00	2.30	2.50	2.80	17.10
16			2.00	3.50	4.50			12.20	22.20
17			3.00	11.30	4.00			25.50	43.80
18			1.00	15.00	4.00			41.00	61.00
19				13.50	5.00			83.50	102.00
20	1.00	0.43	4.00	9.70	1.00	1.65	1.56	101.00	120.35

Sum	11.55	49.05	34.90	149.90	29.05	59.40	82.66	308.90	725.41
Avg	0.43	1.97	1.29	5.84	1.45	2.58	4.86	15.44	14.51
Std	0.30	2.18	1.27	4.16	1.70	1.70	5.64	27.46	23.38

Notes: The largest size achieved by any empire in any century was entered in this table. For the few centuries (29th, 27th, and 26th BC) not included in Taagepera (1978), his data were interpolated. The imperial regions in this table closely followed Taagepera's "empire cores" (p. 116). Africa and America were omitted from this table because of the rare occurrence of data in these regions: among the three largest empires, these included only Carthage in 500 BC, Ptolemee in the 3rd century BC, Mali in 1300 AD, Inca in 1500 AD, and Canada in the 20th century. Carthage and Ptolemee were included in Mesopotamia. Australia, Canada, and the USA were included in Europe. Mali, Inca, Argentina, and Brazil were omitted entirely.

2000 AD, and over battles per war and casualties/deaths per war, so that there is hardly any doubt that battle and war frequencies may be used as indicators of war intensities, when casualties or fatalities are not available for this purpose. These correlations are shown in Table 3.

Although written records have been kept since 3000 BC, the first recorded battle did not occur until about 1469 BC between Egypt and the Palestinians at Megiddo (Dupuy & Dupuy, 1986, p. 6). In that century and the seven centuries to follow there was no

TABLE 3
Correlations Between Frequencies and Intensities

Battle Frequencies	*War Casualties*	*Dates*	*N*	*Correlations*
Per Centuries				
Harbottle	Sorokin 900-200 AD	500BC-500AD	21 Cs.	.79%
Eggenberger	"	"	"	.79%
Dupuys	"	"	"	.78%
Kohn Wars	"	"	"	.71%
Sorokin Wars	"	"	"	.67%
Per War				
Eggenberger	"	"	83 Wars	.63%
Wright	"	1500-1925AD	97 Wars	.79%
Wright	Levy	1500-1940	88 Wars	.95%

Notes: Battles were obtained from all authors in Column 1, unless otherwise indicated, such as by "Kohn Wars."

Casualties were obtained from Sorokin in Column 2, but deaths were obtained from Levy.

%Correlation was significant at the .01 level of confidence which means that a correlation as high as this could have been obtained by chance less than one time in a hundred.

The Authors are located in the references as follows:

Dupuy & Dupuy, 1986.
Eggenberger, 1967, 1985.
Harbottle, 1904 (Bruce, 1981).
Hohn, 1987.
Levy, 1983.
Sorokin, 1937.
Wright, 1965.

more than one recorded battle per century until the 7th century BC, when there were 3 recorded battles, and the 6th century BC when there were 6 recorded battles (Dupuy & Dupuy, 1986). Other authors (Harbottle, 1904, revised by Bruce, 1981; Eggenberger, 1985) found even fewer battles prior to 500 BC, with the earliest one being at Troy in the 12th century BC. Wars, themselves, averaged only 5 or 6 per century from 2000 BC to 500 BC (Kohn, 1987), and the war record prior to 2000 BC was rather vague at best, although there is some evidence that wars occurred prior to that time.

Since records were kept since about 3000 BC, and since historians have always been very careful to record such events as battles and wars, I assume that no record of these events in historical times means that they did not ocur, or that, if they did occur, they did not amount to very much. In a 1500-page encyclopedia of military history (Dupuy & Dupuy, 1986), only 15 pages, or 1% of the total, was devoted to the "dawn of military history" from 3500 to 600 BC. In short, the first half of military history was such as to require very little space, presumably because not very much happened to warrant recording by historians until the emergence of the Medes and the Persians about 600 BC, when war started to become an art. It was much later before it started to become a science as well.

I have analyzed three sets of battles (Bruce's Harbottle, 1981; Eggenberger, 1967, 1985; and Dupuy and Dupuy, 1986) and three sets of wars (Dupuy & Dupuy, 1986; Kohn, 1987; and Sorokin, 1937, Vol. 3). Since battles are more like one another in their intensity than wars, they would be preferred as a measure of war's intensity. Since the Dupuys' battles are more numerous and less Eurocentric than Harbottle's and Eggenberger's battles, they will be used as the preferred measure of war's intensity in this article. Their total distribution is shown in the last column of Table 4. About half of this total has been sorted according to regions, and this sample is shown in the rest of this table. The sample was quite adequate, since it was correlated .99 with the total number of battles over the centuries. The Dupuys' battles were significantly correlated with other lists (Sorokin, 1937; Wright, 1965; Bruce, 1981; Eggenberger, 1985; Kohn, 1987), in addition to which it was the most comprehensive and reliable list available.

TABLE 4
Dupuy & Dupuy's (1986) Battles

Cent	*Europe*	*Mid East*	*Far East*	*South Asia*	*Africa*	*Latin America*	*North America*	*Total Sample*	*Non-Europe*	*Europe % Sample*	*Grand Total*
—15								0	0		1
—14								0	0		0
—13		1						1	1	0%	1
—12								0	0		1
—11								0	0		1
—10								0	0		0
—9								0	0		1
—8								0	0		1
—7		3						3	3	0%	3
—6		2						2	2	0%	6
—5	14	5						19	05	74%	42
—4	19	9		1				29	10	66%	43
—3	37	6						43	6	86%	75
—2	10	12						22	12	45%	30
—1	23	10		1				34	11	68%	61
1	3	2						5	2	60%	9
2	3	5						8	5	38%	12
3	10	15						25	15	40%	44
4	11	5	1					17	6	65%	38
5	18	3						21	3	86%	51
6	4	12	1					17	13	24%	53

7	14	50	1	8				67	53	21%	102
8	19	13	3	3				38	19	50%	66
9	29	15	5	1				50	21	58%	73
10	22	19						41	19	54%	70
11	25	26		3				54	29	46%	91
12	26	32	2	9				69	43	38%	108
13	45	18	11	5	1			80	35	56%	125
14	38	5	4	6				53	15	72%	112
15	68	8	9					85	17	80%	164
16	99	18	7	20	1	1	2	148	49	67%	292
17	203	18	14	22	9	6	18	290	87	70%	500
18	207	28	5	32	1	13	52	338	131	61%	765
20	213	93	148	13	25	5	2	449	286	43%	973
Sum	1294	464	230	162	71	67	189	2477	1183	52%	4511
Mean	51.76	16.57	16.43	11.57	11.83	13.4	37.8	70.77	33.8		128.9
Std	64.69	18.47	36.85	12.83	13.07	14.81	42.7	120.7	67.5		224.6

Correlations Between Civilizations, Empires, and Wars at the Global Level of Analysis

We now have the measures that we need for the purpose of correlational analysis: the number of geniuses as a measure of civilization or creativity, imperial sizes as a measure of empires, and battle frequencies as a measure of the destructiveness or intensity of war. Correlations, of course, measure only similarities of distribution, not causes, which have to be determined by logical argument or empirical evidence outside of the statistical situation.

The dialectical evolutionary theory of civilizations, empires, and wars would suggest that these three should be significantly correlated with one another and, furthermore, that all three should be correlated with time. The correlation between both the raw and the logged scores of world civilization and empire was .90, accounting for 81% of the variance. At the world level, the correlation between civilization and empire was very high indeed. The more civilized we became, the larger was the area of the earth that came under imperial control. Civilizations and empires may not be twins, but they were very close relatives indeed. Civilization seemed to precede empire in time, but empire had the effect of spreading civilization over larger territories, which generally included more people. If civilization was the parent of empire, empire returned the favor by increasing the territory over which civilization was extended. According to this description, there was a dialectical evolutionary relationship between civilization and empire, in the sense that they fed back and forth into each other, contributing to each other's growth in the process.

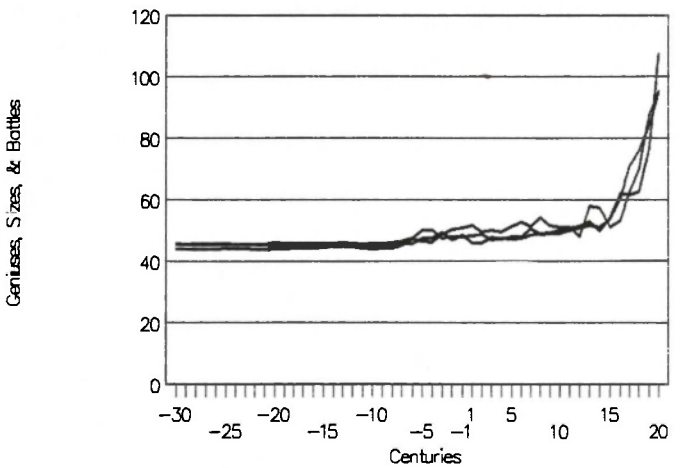
When the sum of the Dupuy battles over these centuries was correlated with the sum of imperial sizes, both variables being logged to correct for skewness, the correlation was .94, which was significant well beyond the .001 level of confidence. When these battles were correlated with the sum of Kroeber's seven civilized activities, both variables being logged, the correlation was .94, which was significant well beyond the .001 level of confidence. The correlations among these three variables were all more than .90, suggesting a very close relationship among them, which is what was required to confirm the dialectical evolutionary theory. It is worth noting that these three measures were obtained from three independent sources (Kroeber, Taagepera, and Dupuy &

Dupuy), so that their correlations were not contaminated by any bias that might have been generated had they been obtained from a single source.

When all of these measures were logged and correlated with the 50 centuries from 3000 BC to 2000 AD (as a measure of historical time), and when these correlations were factor analyzed, a single factor emerged from this process: Number of battles (.98), Imperial sizes (.98), Centuries (.97), and Number of geniuses (.97). The components of this factor are shown in Figure 1, where the raw scores in Tables 1-3 have been converted into standard scores with a mean of 50 and a standard deviation of 10, in order to make these three sets of scores comparable to one another. Factors, like correlations, establish structural similarities, but not causal direction which has to be established outside of statistical analysis.

These results clearly show that, not only were civilizations, empires, and wars correlated with one another, but that all of them were correlated with time, that is to say that all of them were increasing significantly and exponentially over these centuries at the global level of analysis.

Fig. 1. Civilizations, Empires, & Wars 3000 BC to 2000 AD



Regional Correlations

This confirmation at the global level was further confirmed at the regional levels. All four of these variables were significantly correlated with one another in Europe and Non-Europe, and also in the Middle East, India, and the Far East, taken separately. When these correlation matrices were factor analyzed, a single factor emerged in all regions, as shown in Table 5. The factor coefficients were all significant, but the loading of Kroeber's geniuses in the Middle East was rather low.

As far as they go, these results confirmed the dialectical evolutionary theory of fairly close relations between civilizations, empires, and wars over the centuries from 3000 BC to 2000 AD, supporting this theory at the regional levels of analysis as well as at the global level. It is worth emphasizing (again) that the measures of these three variables were obtained from three independent sources, which presumably had no influence on one another.

These statistical findings were consistent with Kroeber's (1944) findings by inspection: "A definitely successful [Egyptian]

TABLE 5
Factor Analyses of Civilizations, Empires, and Wars

Regions	*Century*	*Geniuses*	*Empires*	*Battles*	*Explained Variance*
World	.97	.97	.98	.98	95%
Europe	.94	.93	.86	.96	85%
Non-Europe	.97	.93	.96	.95	91%
Middle East	.95	.38	.94	.95	71%
India	.95	.78	.69	.75	64%
Far East	.97	.95	.94	.80	84%

Notes: The figures in the body of the table are factor coefficients, which are a rough measure of the correlation of each variable with the single factor that emerged from the analysis of the correlation matrix in each region. The last column indicates how much of the variance in these variables over the 50 centuries from 300 BC to 2000 AD was explained by the single general factor. Non-Europe was simply the sum of the Middle East, India, and Far East. Africa and the Americas were left out of these analyses because they became part of the historical world too late for such analyses to be meaningful in their cases. All of the factor coefficients were significant, according to Harman's (1967) table of standard errors of factor coefficients (p. 435), but the loading of Kroeber's geniuses in the Middle East was rather low.

dynasty regularly meant military expansion, accumulation and diffusion of wealth, notable building operations, high-grade sculpture, painting, and often literature. . . . So regular, on the whole, is the concordance of the several curves that evidently they are all only functions of one underlying factor or group of related factors" (p. 240). Indeed, only one underlying factor was found by statistical analysis. Furthermore, "It is evident that Assyrian sculpture followed the fortunes of empire, as Egyptian sculpture had done earlier. . . . It is clear that whether the period was one of city-states or of empires, the achievements of sculpture were dependent on military and political successes" (pp. 245, 247). "The books [encyclopedias and textbooks] regularly describe the architecture, sculpture, and painting [in Egypt] as rising and falling in accord with the politico-economic fortunes to a surprising degree" (p. 665). The correlation between national achievement and cultural achievement was only partial in China (p. 670) and low in India (p. 684), but in conclusion: "On the whole, ethnic or national energy and higher cultural energy tend to be related; but . . . the relationship is not complete. . . . To the question whether there may be national florescences without accompanying cultural ones, the answer must be yes, although such happenings are rare in history" (pp. 795, 844). Clearly, the agreement between Kroeber's insights and the results of factor analysis are striking indeed.

More definite conclusions about the relationships between political or military success and artistic creativity can be drawn from Kavolis (1972, Ch. 3), which notes that "A correlation between periods of warfare and those of artistic creativity has been noted, mostly in Asian civilizations, by Mukerjee (1951, pp. 27-28) and, in Europe, by Sorokin (1937, Vol. 3, p. 365)" (p. 40). Kavolis (p. 155) also cites a factor analysis of 40 modern nations by Cattell, Breul, & Hartman (1952), who found that creative variables, such as high creativity in science and philosophy, high musical creativity, and many Nobel Prizes in Science, Literature, and Peace, tended to cluster together with aggressive variables, such as a large number of riots and frequent involvement in war. Kavolis' more detailed historical analysis suggested that "Artistic creativity tends to increase in periods following those of intensive goal-oriented action (warfare or political consolidations) in the political sphere" (p. 54).

However, Naroll et al (1971) found no significant relationship between their counts of Kroeber's geniuses and the *number of years* of external warfare of the most "conspicuous state" or great power of the civilization during any century. Since the number of years of war tends to increase as we go back in time, even though the actual fighting time decreases, it may not be as accurate a measure of war's intensity as the *number of battles* used in the present study. They also found no significant relationship between creativity and the size of the civilization's largest city, the growth of the civilization, and the degree of centralization: "On the other hand, we found some tentative support for the hypothesis that the more politically fragmented a civilization [the number of independent states within it], the higher its creativity level" (p. 187). This last correlation was .286, which was significant at the .05 level of confidence, but which accounted for only 8% of the total variance. The authors recognized the need to re-test this hypothesis on a new sample before it could be credited.

Some Theories About Regional Rises and Falls

Although civilizations, empires, and wars increased significantly and exponentially at the global level, there were rises and falls at the regional levels, which is why the regional factor coefficients in Table 5 were lower than the global ones.

Spengler (1926-28) attributed these rises and falls to something like a biological process of birth, development, maturity, and decay. This process of growth and decay seemed to be pretty much determined by the nature of the process itself. There was not much in this theory to prevent the decline of the West, which Spengler predicted.

Toynbee (1972) was less deterministic, emphasizing the adequacy of responses to challenges as the determining factor of rises and falls. Adequate or appropriate responses contributed to rising, while inadequate or inappropriate responses contributed to falling. The emphasis was on moral, religious, or spiritual challenges more than physical or environmental ones, but he also emphasized that civilizational rising and falling depended very much upon the rising and falling of the economy: "The inability of a pre-scientific agricultural economy to bear this economic load

[of providing more and more civilian and military services] is evidently one of the causes of the unwished-for collapses by which so many universal states have been overtaken so many times in succession" (Toynbee & Caplan, 1972, p. 63). Just *who* or *what* challenged civilizations was not entirely clear, nor just *how* civilizations responded. But the concept allowed for some free play in the rise and fall of civilizations, and it challenges us to find out what it means operationally if we can, so that it can be studied more scientifically.

More recently, the economic factor has been emphasized by Kennedy (1987) to account for the rise and fall of the great powers in modern history. Armed force is what makes or breaks a great power, according to this theory, and armed forces cost money. Great powers need money in order to become great in the first place, and more money in order to stay great in the second place. But there seems to be a strong tendency for great powers to outspend their greatness. Military expenditures outreach their economic base, exhausting themselves in the process, and losing the next war to an upcoming power who has not yet bankrupted its economy with its military expenditures: "The historical record suggests that there is a very clear connection *in the long run* between an individual Great Power's economic rise and fall and its growth and decline as an important military power (or world empire)" (p. xxii). The author has emphasized the long run, because he is talking about a process that takes time as well as money, but his study of the last 500 years convinced him that "there is a very strong correlation between the eventual outcome of the *major coalition wars* for European or global mastery, and the amount of productive resources mobilized by each side . . . victory has repeatedly gone to the side with the more flourishing productive base . . . the power position of the leading nations has closely paralleled their relative economic position over the past five centuries" (pp. xxiii-xxiv).

In short, wars cost money. To be sure, they also make money, and therein lies the gamble: Can you make more than it costs to make it? If so, war can be a profitable business, forgetting about the casualties for the moment. At least, somebody can make some money (that is, surplus wealth) from it. But, if it costs more than it makes, then bankruptcy follows, and down goes the empire. The

trick seems to be to make war pay by making somebody else pay for it, and to forget about the casualties on both sides, including civilians as well as soldiers.

Summary and Conclusions

The dialectical evolutionary theory proposed relations between civilizations, empires, and wars, such that these three were supposed to interact in such a way as to promote one another's growth up to a point where surplus wealth was diminished until it turned into a deficit. At this point civilizations, empires, and wars could no longer be afforded, so they were lost instead of gained. This loss, however, was somebody else's gain. The loss took the form either of direct conquest by others with more surplus wealth, or of decentralization which made the smaller units prey to future conquest. Consequently, the way up and the way down were virtually the same way of conquest, either directly and immediately, as in the case of Alexander's conquest of the Persian empire, or indirectly and sequentially, as in the case of the many times that Chinese empires were fragmented into feudal states which were later centralized by another conqueror. In either event civilizations, empires, and wars tended to go and grow together, wars serving as both midwives and undertakers in the rise and fall of civilizations in the course of human history.

This dialectical process of evolution (and devolution) presumably began among primitive peoples, although there are little or no traces of it until the beginning of civilization some 5000 years ago. Even at this time the evidence was rather sparse for battles and wars, which did not clearly emerge until about 1500 BC, and which did not amount to much until about 500 BC. However, something like this process may be responsible for some of the movement from the primitive bands to the larger tribes of the gatherers and hunters to the villages of the farmers and herders who emerged some 10,000 years ago.

The same process was presumably responsible for the movement from the agricultural villages to the civilized cities which emerged some 5000 years ago. The process was hardly noticeable for several million years. Neither anthropological nor archeological evidence suggested much growth in population nor territory

among the gatherers and hunters, and not much more among the farmers and the herders. Even the first 2500 years of civilization showed no dramatic increases in population nor territory, nor in signs of civilization, such as statesmanship, philosophy, religion, literature, fine arts, scholarship, science, music, business, etc.

The great leap forward in all of these areas occurred about 600 BC, when the Medes and the Persians developed civilization, empire, and war into arts based on a hierarchical delegation of power such as the world had not known before. The next great leap came with the Muslims in the 7th century AD, another with the Mongols in the 13th century, and finally with the Europeans in the 16th century. The Europeans reached their apex in the 19th and 20th centuries, but they may well be running out of steam and other signs of surplus wealth today. However, they had their ups and downs before, so that even if they may be on their way down now this hardly precludes another rise in the future unless, of course, they happen to blow up the whole world on their way down.

While the whole world tended to spiral upward, as a general rule, during the last 5000 years (judging by Kroeber's geniuses, Taagepera's imperial sizes, and Dupuy & Dupuy's battles), regional areas had their ups and downs, their rises and their falls. Consequently, the general pattern suggested by the analyses in this paper was that of an evolutionary trend in one direction at the global level, which was composed of somewhat cyclical processes at regional levels. At both the global and regional levels, civilizations, empires, and wars were significantly related to one another, tending to rise and fall together. How to explain this basic finding?

It was only after we became civilized, that is, dependent upon land, labor, capital, and trade for making a living, that anything like imperialism and militarism started to make any sense at all. And then they became necessary in order to gain, maintain, and increase the surplus wealth without which there could be no civilization.

At the regional levels, the rises were associated with the establishment of centralized controls by a strong leader whose income exceeded his expenditures in the process. When his or his followers' expenditures exceeded their incomes, then came the falls,

which were characterized by decentralization, feudalization, or foreign conquest. In all cases, the way up not only increased the *quantity* of civilization, empire, and war, but also changed the social *structure* to one of greater inequality, indicated by slavery, caste, class, social stratification, etc. This inequality characterized the relations *between* civilizations as well as *within* them. It would, of course, be most desirable to develop more precise measures of these inequalities in the process of further research. So far, the evidence on this score is largely qualitative, which needs to be strengthened by making it more quantitative.

The terms "rise" and "fall," "up" and "down" etc. follow conventional usage. However, so far as they may connote value judgments of "better" and "worse," they may well be questioned. More civilization and more empire meant more war. More civilization would seem to be "better," at least for those who get it or who get more of it. More empire may be better for the imperial civilizations, but not for their colonies. More war would definitely seem to be worse, all other things being equal, but those who win the wars might not agree with this. A crucial question for further research might be: Do the pleasures of civilization justify the horrors of war? A more pressing question might be: Can we have civilization without war?

Unless we have an instinct of exploitation (which I doubt very much), that is, a desire to benefit ourselves at the expense of others, it would seem that we have no need for war. Human nature is pretty much determined by human beings and human choices. The dialectical evolutionary theory would suggest that we gradually developed ourselves into a pattern of domination and exploitation which virtually made war inevitable. So far as this is true, it means that we can change the structure of the civilization that we have created by changing our choices, which means changing our values, which hardly means changing human nature, whateve that may be.

What values need to be changed in order to have a civilization without domination and exploitation, and therefore without war? One clue would seem to lie in the basic difference between primitive and civilized societies. Primitive societies seem to be more free and equal in their human relations than the civilized societies that we have created so far (Eckhardt, 1975, 1982). If we created more

free and equal human relations, we might be able to create a civilization without war. But we have much more to learn before we can achieve that happy ending.

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