

**TOWARDS A BETTER UNDERSTANDING
OF THE PEACEFUL SOCIETY
OF FIRST WORLD WAR TRENCHES**

by

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SUBMITTED TO THE DEPARTMENT OF
PHYSICS IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF SCIENCE

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June, 1986

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I

The Western Front of the First World War is famous for its bloody battles that served no military purpose, while the war itself caused millions dead to little political effect. In a well-received book, Axelrod [1984] cited sources describing Western Front trench life as often peaceful; British and German soldiers in "quiet sectors" agreed, or tacitly agreed, not to try to kill each other. Axelrod uses this pattern, called "live and let live" by many soldiers of the period, as an example of the emergence of cooperation between initially hostile parties. (Axelrod [1984] is a broad study of cooperation, explaining it as often a rational response to partial conflicts.) This paper examines Axelrod's theoretical claims, and more generally tries to understand why soldiers "lived and let lived" and what was going on in their groups when they did. Like Axelrod, I use Ashworth [1980] as a historical source, and so just consider British troops.

I have used several theoretical structures brought to my attention by my thesis advisor. Ashworth [1980], Marshall [1947], and Keegan [1976] advance theories of what motivates soldiers in war. Other sources discuss reasons for behavior in more general forms of conflict. The most important concepts seem to be roles, as described in Harre [1979], and game theory. The latter is examined to see how far Axelrod's assumptions can be carried. The first issue of interest in this thesis is to see how various theories of social interaction apply to the unusual state of peace within a larger, violent structure. The second issue is to understand the paradox: not just how and why soldiers avoided fighting, but how could they do so against the will of their commanders, who wanted continual aggression? British generals of the First World War are notorious for having

ordered mass suicidal attacks, and being obeyed.

II

The facts and descriptions of this paper come from Ashworth [1980], a study of the live-and-let-live system based on detailed research of records of the wartime British Army and participants. This section summarizes his descriptions, largely in terms of "roles"; and of Ashworth's theoretical constructs: groups of people and the exchanges (interactions) that establish their relationships. For example, an exchange of fighting establishes the adversary relationship and possibly aggressive and defensive roles.

The Western Front was the site of many kinds of war in its four years, from the large-scale deadly battles like the Somme in 1916 to static occupation of trenches. Intensity could also vary in another way: in an "active sector", even static trench life was filled with violent raids and patrols; while a "quiet sector" could feature peace and cooperation across the line. With Ashworth, I will focus on "trench warfare", which he specifies as normal or routine trench life: continuous or small-scale attacks rather than large battles. Here, Ashworth focuses on exchanges, which occur with various pairs of roles: within a group of comrades; between two such groups on the same side; between groups of British and German soldiers; and between staff officers and soldiers. One of Ashworth's main concerns is the form that these exchanges take. Between soldiers on the same side, they are usually verbal; while actions generally had to suffice across no-man's-land. Staff officers and soldiers had communication problems because orders were given verbally, while the responses were nonverbal actions at the front.

Ashworth focuses on live-and-let-live, a system of exchanges within trench war whose goal is to prevent killing. The forms of expression of these exchanges changed throughout the war. First, there were explicit truces and fraternization: verbal communication with the Germans. (Following Ashworth's sources, this is all from the British point of view.) Here, the soldiers assumed the roles of independent actors (truces) and friends (fraternization). Commanders stopped these exchanges by punishing those involved. Soldiers then developed the system of inertia, in which nobody could be singled out as disobeying orders. In inertia, a system with the best claim to the title "live-and-let-live", neither side would fire first at each other. Exchanges and roles here were negative: across no-man's-land there was the lack of fire; British soldiers exchanged restraint with each other; and they all denied the "soldier" role. Commanders tried to destroy live-and-let-live by ordering more firing and making it more automatic. This in turn led to the next form of live-and-let-live: ritualized aggression, or shooting and bombing without killing. The soldier's roles here were sportsmen, conspirators, and fellow-sufferers, against the generals. The exchanges of ritualized aggression were well-aimed or well-timed misses; these were good opportunities for communication, since the aims and times could be chosen. Staff officers ended this, in turn, by ordering raids, in which a party of infantry quietly attacked the opposing German trench. The goal was to kill (or, less likely, capture prisoners), not as part of or in preparation for an advance, but just to keep the military spirit alive in a quiet sector. When raids occurred, they destroyed the live-and-let-live social system; it became impossible to assume that actions were arranged to prevent killing. Raids provoked reprisals which then disrupted the communications pattern of live-and-let-live: fire could not be assumed benign.

Infantry could find only aggressive roles to fit the new pattern of raiding, anger, and the expectation of violence. This is the end of the story, to the end of static trench war.

The soldiers in different military roles had different options, all based on the choice of whether to kill when possible. Infantry, when still, could shoot to kill, shoot to miss, or not shoot. They could also make night patrols and raids, with varying degrees of intensity. (Unless they felt confident about live-and-let-live, soldiers risked immediate death by moving above the trenches in the daytime.) Mortar crews could fire often and at damaging spots to kill; or fire predictably somewhere else and not kill. Soldiers could also desert, but they could be punished by their own side for this. Specialist soldiers (such as snipers and gun crews), more than most infantry, were inclined to follow the "aggressor" role and exchange fire with the enemy; if they exchanged ritualized fire, they became "communicators" of live-and-let-live. Officers at the line acted through command as well as directly and could encourage killing to different degrees. Staff officers had even more indirect options: they could try to give orders which would force soldiers to kill.

Live-and-let-live was a social system--a system of exchanges--that maintained itself in adversity through adaptations: soldiers changed the forms of the exchanges but still tried not to kill. Considering only the front line, the system was inherently stable. Ashworth described the detailed structure of exchanges between compatriots that unifies a battalion behind live-and-let-live. As well as giving positive and negative incentives for individuals to keep the peace, these exchanges reinforced and legitimized people's live-and-let-live roles.

Considering the whole British Army, however, the system was inherently unstable: its result--the transformation of the "soldier" role--was unacceptable to the commanders. The commanders had the upper hand, because soldiers did not generally confront them on the Western Front. Ashworth's book tells the story of the ultimate resolution of this instability.

III

Different theories try to explain the events outlined above, and the following questions that they raise: What is the best factual description of First World War trenches? What were the actual options of the different groups involved? How and why did the trench warfare system-of-options get set up? What were the motivations and roles of the people involved, developing through time? What roles were desired, and which persisted? What were the purposes of communication in the system? In what sense did people make the "right" decisions? What were internal and external sources of change? I will discuss sociological, military, and structural explanations here, but continually using paradigms of all sorts of theories.

Ashworth is a sociologist and sees war as a social system of interactions between and within groups. Deeds are based on social setting; he explicitly ignores any "mysterious, unlearned impulses" of aggression as unnecessary and untestable assumptions. As he describes it, much of the set-up and actions of the developed trench war societies mirror civilian life. From the commanders' end, the war is set up to resemble their conception of war-like exchanges (and roles): hierarchy behind the line, hostility across the line. No matter who was locally "winning", commanders were comfortable with exchanges of ordering-obeying,

linked to violent exchanges with the enemy. British soldiers, on the other hand, felt more comfortable with civilian roles, especially when their "soldier" roles did not reach their expectations. Axelrod identifies a soldier's attitude and motivations with the group he was in: active and passive battalions, front-line infantry, and specialists.

Keegan [1976] is a broad study of battle in past and future that analyzes three historical battles including the British perspective of the Battle of the Somme, fought on the Western Front in 1916. He concludes that the goal of survival motivates most of a soldier's actions in battle: in particular, they will attack and endanger themselves when it is riskier not to. For another example, the front-line soldier's expectation of rescue and medical treatment if wounded will affect where he will go on the battlefield. In the slightly less lethal static trench warfare, these conclusions should still apply, maybe diluted onto a time scale of months rather than days. Keegan does not discuss the origin of the trench system; presumably it is just a solution to logistic problems. The set-up is important inasmuch as it directs people's options. The psychological and communicational set-up affects the credibility of commands and how well they can be transmitted, and thus affects decisions of how risky to be.

S. L. A. Marshall was an American colonel in the Second World War who, during that war, surveyed thousands of soldiers in order to find out how they really fought in the field. His [1947] describes his findings and forms conclusions about the soldiers' psychological motivations. He did not discuss the First World War or British soldiers, but his observations confirm Ashworth's statements. (Ashworth [1980] cited both Marshall and Keegan.) Marshall's conclusion: most

soldiers don't fire their guns when given the opportunity to fire, even when it seems they must to defend themselves. They don't want to kill, and they reject "aggressor" or even "defender" roles. According to Marshall, their dominant impulses are fear, reluctance to kill, and comradeship. In a tense, dangerous situation, his soldiers said they felt isolated and were paralyzed by fear. Marshall claimed that close comradeship can reinforce an aggressive, firing attitude by motivating continual alertness and positive activity. Under Marshall's system, live-and-let-live is a happy relaxation of fear and isolation.

Different perspectives on war may come from observing different conditions. Ashworth's view of war as a society presupposes a long or static war and emphasizes the war process itself over the war aims. Keegan emphasized options in the more clearcut win/lose situation of a battle. Marshall observed fluid situations in which soldiers were under continuous pressure to make decisions. Axelrod's game theory analysis, discussed later in this paper, uses Ashworth's perspective.

IV

This section presents an attempt at a clear description of the actors and exchanges of Ashworth's trench warfare, by following the development of roles, norms, and expectations of roles. The starting point is necessarily the people involved, their physical environment, and their possible roles, relationships, and exchanges (instrumental and communicational). The British side included infantrymen, specialist soldiers, line officers, and staff officers, initially structured toward thinking at the top and obeying at the bottom. Individual soldiers were supposed to be like parts of a machine, and specialist soldiers were

set up as machine-like technicians. Relationships and exchanges with the Germans were similarly specified: at the top, strategic exchange and the roles of game-players; at the front, exchanges of fighting and the roles of aggressor and defender.

People's actions and responses in trench warfare can be expressed in terms of roles and patterns of control. Because they were part of an army, British soldiers had natural relations of interdependence. In a fighting situation, they were to cooperate as elements in a large plan, as illustrated by Keegan's description of the planned coordinated infantry advance and artillery barrage in the Somme attack. As the war progressed it became clear that artillery had more power over infantry than vice-versa. Gunners then expected accommodation but, when in live-and-let-live, accepted "protector" roles by creatively sustaining infantry lives. An example of this is the exploitation, or deliberate ignoring, of "tender spots" in the opposing trenches. (These were targets that the artillery could hit and cause great damage to the enemy.)

The relation between British officers and soldiers was based on the class system. Soldiers were largely working-class; officers were middle- and upper-class. The staff officers had the roles of "strategists" and identified their personal goals with those of the nation. Line officers were intermediate bosses: they had to transmit orders to the soldiers and maintain their roles. They tried to do the latter by structuring their roles as in civilian exchanges; unfortunately, their notions of civilian life--they often thought of boarding school--differed from the working-class norm. The common soldiers were set up to courageously, uncritically obey. If Marshall's findings apply here at all, however, the tension

and danger of war necessarily destroyed the reality of these roles. Soldiers then searched for new roles that could accomodate their new expectations. Due to the difficulty of communication to the top, the commanders refused to recognize any creative role-adaptation by soldiers. This created the instability (described above) in the exchanges between British officers and soldiers.

The most dangerous exchanges considered here occurred between British and German soldiers. The initial set-up and chain-of-command implied the roles of adversaries: alternately "agressor" and "defender". Marshall [1947] implies that "agressor" is a psychologically tough role to maintain, and even "defender" will slip into passiveness. In addition, the normative claim that it is right to kill yielded the role-expectation of further killing, an unpleasant prospect to a man who sees repeated pointless deaths. Infantrymen then sought the civilian norm of calmness and an expectation of future life.

Relations, exchanges, and roles developed throughout the war as parties sought more congenial roles. The British infantrymen who spent month after month in the trenches grew dissatisfied with the role of "brave, mindless soldier". Officers at the front with them felt the contradiction between the generals' contentment and the soldiers' rejection of their roles: the line officers' dual roles as "transmitter of orders" and "leader" became impossible. Of course, it was easy to reject a role, harder to act to fill a new one. Live-and-let-live allowed this. (Due to the isolation of commanders from the battlefield, infantrymen could change roles and relationships and it took awhile for the staff officers to respond.) The exchanges of fraternization and truces implied a cooperative relationship among soldiers of both sides, who had new roles of "ambassadors" and

"maintainers of the peace". In addition to directly stopping these exchanges by punishing those involved, commanders implied the message that only fighting roles were acceptable. Thus was born a necessary conflict: British infantry in trench warfare had to struggle against their Germans or against their own generals.

The later passive action of inertia fit the purely civilian role by denying the war. Of course, this could never be made to work well, partly because of the continued presence of more aggressive battalions, or even their own artillery. In any case, commanders attacked the "civilian" role directly--by ordering killing. This was done by rotating battalions into battles and by ordering continual patrols and fire against the Germans. At this point, live-and-let-live showed its persistence. The stable society of the trenches was fertile ground for ingrown development of roles by soldiers--new soldiers would learn from the old and from obvious exchanges of peace. When commanders specified more active and dangerous exchanges across no-man's-land, soldiers altered these exchanges toward peaceful purposes. In both inertia-with-retaliation-against-peacebreakers and ritualized aggression, their roles moved thus from "civilian" to "maintainer of peace", this time against commanders of both sides. Artillery was an active participant in this; finally their "statements" could carry meaning within live-and-let-live. (The statements were: "this is a retaliation of your disruption of the tacit truce", or "we can kill you but we're choosing not to".) Raiding, when carried out, forced violence and necessitated "aggressor" and "defender" roles, or at least the attitude of acceptance of the violent situation. Commanders accepted these roles and, in turn, interpreted their violence-oriented manipulations in

terms of their roles as "leaders".

As described by Harre [1979], exchanges communicate as well as effect instrumental (substantive) action; the substance and form of exchanges help establish relations and roles. An obvious example is orders from an officer to a soldier: they both tell what to do and reinforce the hierarchical roles. Exchanges of fire showed bellicosity. Earlier truces and fraternization showed the communication that would have predominated on the static front if allowed. Later exchanges were more sophisticated, trying to project aggressive roles to the generals while saying "peace" to other soldiers. (This could work the other way too, as in the French Army mutiny of 1917. At this time, the generals believed the soldiers were refusing to fight, but if Ashworth is correct, they were refusing to shoot first, but willing to retaliate if the Germans broke the peace. The soldiers did, of course, refuse to cooperate in a large French offensive.) Exchanges of peace, especially within systems that allowed retaliation for rule-breaking, showed by their very existence that there was communication and response. Ritualized exchanges of non-lethal aggression served the above purpose and also communicated readiness to fight. This communication was in fact necessary; roles such as "peace keeper" were useless without the recognition by others of the role.

New exchanges and norms affected different groups in varying ways, of course. Influenced by Keegan [1976], I note that the danger of the trenches encouraged soldiers to experiment with exchanges that radically questioned roles, if they could make life safer. Their challenge was to create a social system based on civilian roles and morals while incorporating danger, death, and killing; and

they were satisfied with the resultant role-pattern of "won't bother them if they don't bother us." Gun crews felt more comfortable using their skills to preserve life, not to kill, especially when the former was set up as a system of acceptable roles. The commanders were in the opposite position: they were satisfied with the dangerous set-up and gave life a negative value--a good battalion had more fighting spirit and received more casualties. This fit their grand strategy of attrition.

The morality of war was a brutal change from that of British civilian life. Live-and-let-live allowed a more compatible morality and was also, according to Ashworth, reinforced by moral feelings. This is because, in the cooperative system, a dangerous act done by somebody of either side was immoral: it added immediate danger and also endangered the confidence and trust of live-and-let-live. This moral censure created exchanges within each side, in which soldiers would encourage and enforce cooperation across no-man's-land. In an active sector, this morality reinforced the other way: soldiers in the trenches had to shoot Germans on sight, or else their comrades were endangered by the visible Germans. Marshall [1947] fits both these situation with one of his main conclusions: people in a group feel a moral imperative to protect each other. In either case, morality meant safety: in one situation, the German was a "maintainer"; in another, an "agressor". People naturally wanted to settle into a moral role; this meant adjustments in both morals and roles.

In summary, roles and exchanges changed in trench warfare because people involved were unsatisfied with them. Front-line soldiers were unsatisfied with purposeless, random death and moved to a peaceable role. Commanders did not

want peaceful trenches; it did not allow them to live their roles. With live-and-let-live, soldiers got what they wanted, and, for a while, commanders were powerless to alter this. They wanted to, though, and resolved this instability by ordering raids, in which context soldiers could not maintain peaceable roles. They certainly could not project such roles to the soldiers in the trenches they were raiding.

V

Axelrod [1984], the starting point of this paper, considers strategies, rather than exchanges or roles, to be the basic description of a social system. This section examines what can be learned by this method: looking at trench warfare as a game. The basis of game theory is that the "players" act consistently. These actions can then be interpreted as choices among options, the outcomes of which have varying desirabilities. The players are then assumed future-directed: they act with the sole goal of maximizing future payoffs. When there are two or more players, their actions affect each others' future payoffs and actions; they must then develop strategies. Game theory is useful when it shows how to find these general patterns of action based on others' moves. In typical multi-player games, the interaction of strategies is a form of communication; this is due to the possibility of changing strategies in the future. Game theory is ineffective when options and payoffs change unexpectedly during the game; the one cannot tell if people act consistently, because there can be no past standard of comparison. Snyder and Diesing [1977] try to resolve this problem by analyzing a "supergame" of well-understood subgames. In the supergame, players' actions change the subgame they are also playing, with interacting decisions yielding new subgame

situations. The play of the subgames determines the players' actual payoffs, but each player has a larger goal of moving to a subgame whose payoffs are more favorable to him. In any case, a serious problem with applying game theory to human exchanges is that people will not be consistent. Feelings about the past--before the game starts--and morality may, on-and-off, affect decisions. Psychological considerations cannot be incorporated into options and payoffs if their causes are not understood.

Nonetheless, one can follow Axelrod and apply as much game analysis as possible to trench war. A basic strategic decision will correspond to one side of one of Ashworth's "exchanges", such as fighting, ritualized aggression, covert truces of inertia, and overt refusal to fight. The exchanges to be modeled should also include those internal to the British Army: orders from above, constraints among soldiers to prevent firing, and others. In the underlying game, the historically occurring exchanges must be reasonable. The players should not have better game options that they simply ignored or didn't notice, if there is no explanation for this ignorance.

Axelrod's game makes further simplifications on this line. His individual players are battalions on the front; soldiers are not considered separately, and commanders are given no role. On the national level, the war is claimed to be a zero-sum game (this assumption does not come into the analysis). On a local level, Axelrod calls trench war a sequence of two-player prisoner's dilemmas. In each such game, it is profitable for a battalion to cooperate (refrain from firing) with an opposing battalion, and even more profitable to defect (fire) when the opposition cooperates. The key to success in this game is to get your opponent to

cooperate. Axelrod [1984] concludes that the best strategy toward this is "tit-for-tat"; he likens the live-and-let-live system to two battalions, each using the tit-for-tat strategy against the other. Tit-for-tat is a simple strategy: to play it you always cooperate, except just after your opponent defects. In this case, you defect, but only as long as he does; once he resumes cooperation, so do you. This is indeed similar to live-and-let-live in some of its "inertia" phases, in which soldiers deliberately did not fire at exposed enemies but would, in fact, fire in response to an unprovoked attack, to show their anger at the breaking of the peace. Purely from considerations of game theory, Axelrod [1984] shows that tit-for-tat is the best strategy to use in a sequence of prisoner's dilemmas and that tit-for-tat will predominate in such a game. At the same time, he observes that in the "trench war game", which he models as above, the tit-for-tat-like exchanges of live-and-let-live emerge. He uses this correspondence as evidence for his claim that live-and-let-live could have arose as a purely strategic decision among battalions.

I dispute this claim by questioning the applicability of Axelrod's game theory model to real trench warfare, at least as described by Ashworth [1980]. For one thing, the theoretical structure of the model seems too simple: interactions and exchanges between groups smaller than a battalion must be ignored. Axelrod's model does not try to incorporate these interactions, even by adding options and increasing payoffs for outcomes that allow internal communications. The players are allowed no past life or preferences, except for reducing casualties. Once settled in a pattern of cooperation, Axelrod says, the soldiers developed an ethical sense that condemned any threat to break the cooperation. These ethical feelings then increased the personal payoffs for

cooperation. This description seems backward, because in real life, the soldiers had moral beliefs from the start. The trench war exchanges or "game playing" may illustrate the persistence of these feelings, but cannot explain them.

It may be possible to add the effects of group behavior such as this to Axelrod's system. If individual soldiers became the players in this new game, members of a group would have nearly identical payoffs for outcomes. Since they have similar objectives, they will work together, and within-group exchanges stabilize the game. Ashworth describes this in detail, especially with groups of front-line soldiers. Inclusion of this effect perhaps justifies Axelrod's two-player simplification. This simplification will not work when different groups on the same side, such as infantry and artillery, conflict.

As a political matter, I dispute the claim that the First World War was a zero-sum game; more realistically, the longer it continued, the more both sides lost. This issue does not affect Axelrod's analysis, though it may give insight into his conception of a game model.

Finally, and most important, I dispute the model's specific assumption of a "prisoner's dilemma": the claim that it was always immediately better to shoot at the Germans than not. Axelrod reasons here that a dead German can't shoot back in a battle, so killing him makes you safer. (One may first reject this by replying that, if you shoot a German, his comrades may respond by shooting back. This is not a legitimate objection, however, when considering immediate payoffs. Possible German retaliation corresponds to future moves and affects strategy, rather than payoffs.) Even in the purely local sense, though, the utility of firing depends on the situation. In an active sector, a visible German soldier may be

about to fire, or to look for vulnerable spots. In this case it is immediately safer to fire. In a quieter sector, the German is no threat, so there will be no immediate bonus--no temptation to defect by shooting. This objection is strengthened if psychological impulses are included in the payoffs of outcomes. Marshall [1947] implies that the action of shooting someone, or of acting at all when afraid, is very difficult; this subtracts from the payoffs. Keegan [1976] and Ashworth [1980] imply that battlefield chaos, which results from increased firing and danger, is also a minus. The result of all of this is that the game is often not a prisoner's dilemma, but rather a simpler game in which both sides want to cooperate and neither side has any temptation to break the peace. Then, the interesting question is not: how did peace begin or survive?, but: why was there not always peace in the trenches? This second question cannot be answered in any way within the above game model.

The rest of this section sketches a slightly more complicated transcription of some of the trench war exchanges into game theory, somewhat based on Snidal [1985]. As above, exchanges in real life correspond to pairs of moves by players in the game; here, however, the players are individual soldiers (of both sides). Commanders are not directly players in this game; they set up the game, and they change the payoffs for soldiers on their side when they see outcomes they (the commanders) don't like. The time scale here is long enough that we need not consider actions that do not allow communications. These unreciprocated actions, part of no system, are superseded by such actions placed in a communal framework. (For example, instead of a soldier unilaterally declaring a truce, a whole battalion could be looking for a truce. Presumably, in a long time scale, the

unilateral action can be ignored as having no future effect.) The desirability of different points of action varies with the situation. In particular, an active sector will better support dangerous exchanges than a quiet sector. In this model, soldiers in the two types of sector may be playing the same game, but the different prevailing patterns of play in the two situations necessitate different strategic responses.

This game, as it applies to the trench war society, somewhat resembles the game of "coordination", described by Snidal [1985]. In its simplest form, this game involves two players with similar goals who try to "coordinate" their plans; they both want to cooperate, but have different local goals within cooperation. In the more complicated, multi-player trench war game, the soldiers all want some sort of peace, but on different terms: for instance, some may want complete passivity, some will not fire first but want to retaliate against enemy fire, while some prefer ritualized aggression. If everybody does his own thing, this combination will not succeed; because everybody wants some sort of peace, they must overcome their difficulties and coordinate their strategies.

For any British soldier or group, the desirability of different coordination points was decided by several factors, beginning with danger from German fire (and from some British artillery falling short). From this danger, infantry preferred forms of live-and-let-live with minimal fire; artillery, on the other hand, had no quarrel with a system that included artillery fire, so that they could communicate (affect future game outcomes) too. Another danger for all was British officers punishing rule violations. This factor clearly varied much during the game, as new orders came in. Presumably, this threat yielded coordination

points with more warlike actions, or closer to real aggression. If strategic soldiers took into account the adaptability of command, they would also prefer clustered coordination points, so that as the game changed they could easily move from point to point without disrupting communications. (Players in the coordination game always try to maintain communication, so that they know how to coordinate with the other players' future moves. If the players of a multiplayer game lose communication in a game with changing payoffs, they may find themselves confused, each separately seeking to coordinate with all the others.) The payoffs of the outcomes are also affected by psychology; this game theory model will include as much of this as can be easily added. The psychological factors should include: a sense of community (and continuity from prewar times); comradeship; reluctance to kill; and any established norms and morals. Of course, it is impossible to actually label all possible choices and coordination points, let alone evaluate their psychological payoff. Perhaps one can imagine such a model, though.

The commanders' indirect power to change the payoffs keeps the game fluid by occasionally eliminating coordination points (by making them undesirable) and creating new ones. The goal of the commanders is to move the outcome to mutual aggression, a point desired by almost none of the game players. In the short term, commanders try to do this by repeatedly changing options and payoffs, thus ruining the value of communication in exchanges; coordination reappears, however, because of its ready accessibility and acceptance by players. Commanders destroy coordination more permanently in two ways: first, by making violence more of a "plus" by making the alternative worse--that is, kill or

be punished. Second, they try to direct the game towards a kill-or-be-killed (by the Germans) situation. In game terms, this would be a coordination point of fighting whose only virtue is that it is preferred to any nearby options (such as passively getting killed).

As Snidal [1985] points out, when the players in the coordination game have a continuous range of options, then at the local level the choice of coordination points resembles a prisoner's dilemma. Conversely, the supergame of Snyder and Diesing [1977] is like a coordination game, with players jockeying for position in the choice of subgames. Perhaps, then, the above-described coordination game can be translated into a supergame. Individual outcomes are then small games, such as exchanges of peace, fighting, or retaliation-and-response. The main difference between this supergame and Snyder and Diesing's is in the players' strategic goals. In the standard supergame--or the standard coordination game--players have nothing better to do, so they jockey for position versus the other players. In the trench war supergame, the players' main long-term goal is to survive repeated changes in the game itself, indirectly caused by their own cooperation.

It seems reasonable, then, to study a new game in which the commanders are explicitly recognized as players. At its simplest, this could be a two-person game of British generals against British infantry. The German soldiers would be assumed to follow the British lead, and the measure of who is winning the game--generals or infantry--is the number of casualties. Or, analogously, generals play against soldiers in the supergame, with soldiers pushing for a "survival" game and generals preferring a "win/fight" game. The problem with such an approach

lies in the irony that the officers, who thought the war was a game-like struggle, acted erratically in pursuit of their goals of affecting trench society. It seems that they thought in terms of inspiration rather than social reinforcement, and did not visualize static, terrifying trench warfare. Their haphazard actions do not follow the rationalistic assumptions of game theory, given above. More specifically, the generals had great powers over front-line behavior, as in fact was shown by the success of the raiding order. I don't see how game theory can include the blurred perceptions that caused the commanders not to use their power effectively.

In summary, game theory is a limited method of analysis of live-and-let-live. Axelrod's model suffered from oversimplicity and an unwarranted assumption of a local prisoner's dilemma. A more complicated model, based on coordination or the supergame, gives some insight on the value of communication in continuing live-and-let-live, but the model does little else. Finally, the relationship between British generals and soldiers--each side was trying to manipulate or fool the other--seems most like a strategic game, but cannot be analyzed as such.

VI

This small section discusses the question: how much power did headquarters have over soldiers of the Western Front? This is the major factor, after the soldiers' development of peaceful exchanges, that determined the progression of live-and-let-live. Clausewitz wrote that "war is . . . an act of force to compel our enemy to do our will" (Paret [1976]) and logically progresses to a total, all-out effort. He then noted the factors that bring some moderation to war; these included the superiority of defense, uncertainty, and the inability to throw

dispersed resources all into one battle. At another level, war is an act of force compelling soldiers to do the officers' will, as noted in Keegan [1976]. (Marshall [1947] is all about how to make soldiers behave aggressively, but through encouragement and psychological manipulation, rather than coercion, by officers.) One can then search for factors that keep war from its logical extreme of continual aggression (or continual peace, if the soldiers get the upper hand). Similarly, the generals are obstructed by the extra effort of changing roles, rather than leaving them as they are; uncertainty of what to do and how to motivate soldiers; and the inability to spend much effort on changing static trench warfare amidst the distractions of major battle plans.

The rise and fall of live-and-let-live is a story of staff officers struggling for control over trench war roles, and their final success. As noted above, they were impeded by their frequent misunderstanding of front-line actions and motivations. This confusion, characteristic of so many wars--and hierarchies--may be necessary: perhaps the only way commanders can accept their roles as leaders in a bloody war is to misunderstand it. They did interfere occasionally with live-and-let-live, however, showing that they had the power to alter soldiers' roles and the tone of a war--even if they didn't know what they were causing to come next. More specifically, their most effective tool was to lead soldiers into situations of kill-or-be-killed-with-your-comrades. This applies to the raiding society, and it fits Marshall's findings on soldiers' motivations in the field.

VII

This conclusion discusses the major questions that motivated and were developed in this paper. The thought-provoking model of Axelrod [1984] was

deemed unreasonable, and an extrapolation of it indicates that no such game theory approach can model the interesting features of live-and-let-live in the trenches. In particular, Axelrod failed by trying to resolve the apparent paradox of why soldiers develop peace within a war society, while downplaying the important roles of the officers who can maintain the system that the soldiers defy. An analysis of roles and role-relationships, inspired by Ashworth [1980] and Harre [1979], gave the most effective theoretical understanding of the changing trench war exchanges. This analysis revealed the underlying instability of the maintenance of the soldiers' and officers' preferred roles. Peace can, and will, form at any time within war; the Western Front's quiet sectors were an extreme case. On the smallest scale--soldiers not trying to kill--officers seem to have little power to prevent its outbreak. As for peace on a large scale, involving exchanges between many soldiers: commanders can alter this, as long as they know it is going on.

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ACKNOWLEDGEMENT

This paper would have never have been without my thesis advisor. For one thing, he referred me to every item on the above bibliography, starting with Axelrod [1984].

BIOGRAPHY

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