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Explaining it all

Life's a game

NonZero. By Robert Wright. Pantheon; 435 pages; \$27.50.

Reviewed by Mark Greenberg, The Economist, July 13, 2000

In the theory of games, a non-zero-sum game is a situation in which one participant's gain is not necessarily another's loss – in which the gains and losses do not sum to zero. Trade is a non-zero-sum game since seller and buyer can both improve their positions. In zero-sum games, by contrast, there is a fixed total of prizes, with the consequence that any person's advantage must be at the expense of someone else. Poker is a zero-sum game; so is competition between suitors for the same mate. There is nothing to be gained from cooperation in zero-sum games, but participants in non-zero-sum games typically stand to do better by cooperating with each other than by singly pursuing their individual interests. And human life, competitive as it is, is full of non-zero-sum situations. From our hunter-gatherer beginnings to the contemporary global economy, the total pool of goods is larger when people cooperate, divide labor, and specialize. In fact, competition increases the value of cooperation: a society that harnesses the synergy of its members will be more effective at competing with other societies.

In his new book, *Nonzero*, Robert Wright – a journalist whose previous book *The Moral Animal* brought evolutionary psychology to a wide audience – uses the notion of a non-zero-sum game to offer a wide-angle view of both history and biological evolution. Wright argues first that history has an overall “direction” or “arrow” – toward greater social organization and complexity. In his view, a mechanism that he calls “the logic of

non-zero-sumness” propels humans to construct more and more encompassing economic, political, legal, and informational structures. Second, Wright makes a parallel argument with respect to biological evolution: it also moves in the direction of greater complexity, and for the same basic reason. Putting the two parts together, he argues that a global level of organization, which we are now approaching, was very likely from the beginning of life on this planet.

By examining history through the lens of non-zero-sumness, Wright builds a good case for his arrow of history. He takes the reader on an original and wide-ranging tour of human cultural evolution – big-game hunting, agriculture, war, information technologies, feudalism, capital markets, environmental threats, supranational organizations – that explains and illustrates the “logic of non-zero-sumness”. New technologies tend to create non-zero-sum situations. But such situations do not guarantee win-win outcomes: communication and trust are essential. On balance, Wright argues, we are successful at creating social structures or technologies necessary to overcome communication and trust barriers, at the same time expanding social interdependence and increasing the potential for further non-zero-sum interaction. His account of history is full of rich and unusual detail, ingenious insights, and bold argument.

At the same time, Wright overplays the importance of his central idea -- no surprise in a book that attempts to explain the three-billion-year history of life in terms of a single concept. For example, he emphasizes non-zero-sumness at the expense of Darwinian logic. He claims that the “core pattern” of “history’s basic trajectory” is for societies to increase in complexity, driven by a universal human aptitude for reaping the benefits of non-zero-sum situations. Much of the plausibility of his account turns,

however, on a catch-all clause that deals with societies that do not increase in complexity: societies that do not organize themselves effectively are conquered or outcompeted by societies that do. This aspect of the mechanism of history has less to do with a shared human tendency to reach win-win outcomes than it does with the familiar logic of natural selection. Regardless of what it is that makes a society effective at reproducing itself – at aggressively spreading and conquering – all societies will eventually be replaced or subsumed by those that are most effective at doing so. What Wright has shown is that realizing non-zero-sum potential is an important way in which a society may become effective at reproducing itself.

Wright's emphasis on the pattern of increasing complexity leaves room for only a brief discussion of the equally salient fact that some societies increased in complexity so much faster than others and then conquered the others. Wright rejects theories of genetic or racial superiority, which are sometimes offered to explain the disparities between different societies. He devotes an interesting nine-page chapter to arguing that differences in population density account for the disparities. The population density explanation fits neatly within Wright's overall argument because increases in population density both magnify the advantages of cooperation and facilitate cooperation, for example, by making communication cheaper and faster. But the discussion, though suggestive, does not come close to establishing that population density is the whole explanation. And Wright does not address other explanations that have been offered that might mesh less well with the dynamic of non-zero-sumness. It is especially surprising that he mentions only briefly and in passing Jared Diamond's recent Pulitzer-Prize-winning book *Guns, Germs, and Steel*, which develops an elaborate argument that it is

not genetic differences between peoples, but features of their environments – for example, the presence of domesticable animals and plants – that account for the disparity between the rates of development of different societies.

After making his case for direction in history, Wright turns to the argument that biological evolution has the same basic direction, and is driven by the same logic. He puts the notion of a non-zero-sum game to interesting use in explaining why more and more complex creatures were likely to evolve. The study of collaboration, conflict, and cheating between genes, subcellular organelles (apparently once separate organisms), and cells -- as well as between separate organisms – is a fascinating aspect of recent evolutionary biology, and Wright effectively pulls the ideas together under the rubric of non-zero-sumness. For example, systems to prevent cheating are needed if the different cells of one person's body are to realize the benefits of cooperation, just as they are needed if people are to engage successfully in large-scale collective enterprises.

Talk of a single “direction” is, however, less apt in biological than in cultural evolution. As Wright accepts, natural selection has steadily produced not only more intelligent organisms, but also organisms with technologies of diverse kinds. And bacteria, insects, and crocodiles go on successfully being bacteria, insects, and crocodiles. Thus, the parallel with human history is less close than Wright sometimes suggests. These biological examples also bring home the points that reaping the benefits of non-zero-sumness is just one way of succeeding at replication, and that selection cares only about successful replication, however driven.

In order to support his claim that the planet-wide interdependence and cooperation of an intelligent species were highly likely from the beginning of life on

Earth, Wright needs to bridge the gap between biological and cultural evolution by showing that natural selection was very likely to produce intelligence of the sort needed to create culture. He offers a story about how language and intelligence evolved and about what is necessary for them to do so, but, given the current state of knowledge on the subject, the story is little more than interesting speculation.

In his final chapters, Wright ventures the much less plausible suggestion that the direction of organic and human history supports the conclusion that life has a design or purpose, even a divine one. It might be tempting to dwell disproportionately on this unconvincing (and extremely brief and tentative) ending. But it would be unfortunate if Wright's attention-grabbing conclusion were to obscure his accomplishment in giving us an original, accessible, and thought-provoking view of history.