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Gaming, Play and Education

"Let the main object of this, our didactic, be as follows: To seek and to find a method of instruction, by which teachers may teach less, but learners may learn more."

The Great Didactic of Comenius
(1628-1632)

I. THEORETICAL SPECULATIONS IN REGARD TO PLAY AND GAMING

Games and play are universal attributes of man — present to our knowledge at all times and all places inhabited by man. This aspect of man's behavior, however, has not caught the attention of serious social thinkers until quite recently. Johan Huizinga, rector of the University of Leyden, in his work *Homo Ludens* — (Man the Player) published in 1938, analyzed the functions and structure of play as it relates to culture.

Briefly, Huizinga contends that culture is dependent on play — that the spirit of play animates essential aspects of all cultures such as law, war, poetry, philosophy, art and others. Huizinga also attempts to define play in the following terms:

> Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside "ordinary" life as being "not serious," but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves in secrecy and to stress their difference from the common world by disguise or other means.[1]

Roger Caillois, the French sociologist, gives due credit to Huizinga's pioneering efforts in the analysis of play, but finds the above definition both "too broad and too narrow."[2] He is critical of the exclusion of games of chance from the definition and the inclusion of secrecy and mystery. Caillois correctly points out that Huizinga's work "is not a study of games, but an inquiry into the creative quality of the play

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[1] Johan Huizinga, *Homo Ludens: A Study of the Play Element in Culture* (Boston: The Beacon Press, 1950), p. 13.

[2] Roger Caillois, *Man, Play, and Games* (New York: Free Press of Glencoe, 1961), p. 4.

principle in the domain of culture, and more precisely, of the spirit that rules certain kinds of games — those which are competitive."[3] Caillois defines play

. . . as an activity which is essentially:

1. *Free:* in which playing is not obligatory; if it were, it would at once lose its attractive and joyous quality as diversion;

2. *Separate:* circumscribed within limits of space and time: defined and fixed in advance;

3. *Uncertain:* the course of which cannot be determined, nor the result attained beforehand, and some latitude for innovations being left to the player's initiative;

4. *Unproductive:* creating neither goods, nor wealth, nor new elements of any kind; and except for the exchange of property among players, ending in a situation identical to that prevailing at the beginning of the game;

5. *Governed by rules:* under conventions that suspend ordinary laws, and for the moment establish new legislation which alone counts;

6. *Make-believe:* accompanied by a special awareness of a second reality or of a free unreality, as against real life.[4]

Caillois makes a most original contribution in developing a taxonomy of game forms which in various combinations can categorize most existent games. He attempts to ascertain the dominant elements of games such as competition, chance, simulation, or vertigo — he calls these *agon, alea, mimicry* and *ilinx.* Agonistic games are those involving two sides in competition (such as baseball, football, soccer, tennis, chess, etc.) and dominated by skill or merit. Aleatory games (from the Latin for dicing) are characterized by outcomes over which the player has no control (such as roulette, heads or tails, lotteries, etc.) and in which chance or fate is the dominant factor. Mimicry involves play-acting or pretending to be someone else (such as children playing house, or cowboys and Indians; or adults participating in masquerades or spectables). Finally, Caillois defines ilinx as games " . . . based on the pursuit of vertigo and which consist of an attempt to momentarily destroy the stability of perception and inflict a kind of voluptuous panic upon an otherwise lucid mind. In all cases, it is a question of surrendering to a kind of spasm, seizure, or shock which destroys reality with sovereign brusqueness."[5] Examples of this form would include activities involving speed, falling, or rapid rotation such as skiing, racing, mountain climbing, or the various dizzying contraptions found at amusement parks.

Several theorists in different disciplines have taken up the concepts of play and games to develop models of behaviour in their respective fields. The work of John von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior,*[6] led to the development of mathemat-

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[3]*Ibid.,* p. 4.

[4]*Ibid.,* pp. 9-10.

[5]*Ibid.,* p. 23.

[6]John von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior* (Princeton, N.J.: Princeton University Press, 1944).

ical forms of use in social analyses. Erving Goffman[7] employed the dramaturgical model as a device to describe human interaction. William Stephenson[8] using the seminal work of Huizinga has developed a play theory of mass communication. Piaget[9] and George Mead[10] have analyzed the role of play in the moral and social development of the child. Recently Eric Berne[11] has used a game model in order to describe certain patterned social relationships, based on his psychiatric experience. Most of us have chuckled at Stephen Potter's amusing works on "gamesmanship" and "one-up manship."

As implied in the first paragraph, gaming and play as operating behaviour have been in existence much longer than analytical thought about it. For the remainder of this paper an examination will be made of uses and developments by practitioners of gaming devices and some of the *pros* and *cons* regarding their uses with a special emphasis on educational potentialities. In order to avoid definitional elaboration, a game or simulation (the two terms will be used interchangeably) will be defined as a decision-making exercise, involving a model of a behavioural system, and actors or players.

II. OPERATIONAL GAMING

The Development of War Games

Armies were the first organizations to manifest an interest in gaming as a training device. One early author declares:

> The game of chess is the oldest form of a war game and modern maps maneuvers have grown out of the game of chess by a long process of evolution.[12]

Whether or not this statement is accurate, there is other historical evidence to demonstrate the early interest on the part of the military in developing war games. For some three centuries or more the armies of central Europe have been employing and developing war games. The German States perhaps more than other areas showed the most ingenuity and interest in these techniques. In the German state of Schleswig, in 1798,[13] a new form of game was utilized in which actual

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[7]Erving Goffman, *The Presentation of Self in Everyday Life* (Garden City, N.Y.: Doubleday Anchor Books, 1959).

[8]William Stephenson, *The Play Theory of Mass Communication* (Chicago: The University of Chicago Press, 1967).

[9]Jean Piaget, *Play, Dreams and Imitation in Childhood*, trans. C. Gategno and F. M. Hodgson (New York: Norton, 1951).

[10]Anselm Strauss (ed.) *The Social Psychology of George Herbert Mead* (Chicago: Phoenix Books, the University of Chicago Press, 1956).

[11]Eric Berne, *Games People Play: The Psychology of Human Relationships* (New York: Grove Press, 1964).

[12]Farrand Sayer, *Map Maneuvers and Tactical Rides* (Springfield, Mass.: Springfield Printing & Binding Co., 1908), cited in K. J. Cohen and E. Rhenman, "The Role of Management Games in Education in Research," *Management Science*, Vol. VII (Jan. 1961) p. 132.

[13]*Ibid.*, p. 132.

maps replaced older kinds of game boards. The map was divided into a grid of 3,600 squares upon which pieces were moved in a way resembling the marches of troops. Topographical features also were taken into account. The very complexity of the game led to numerous criticisms, and in the early part of the 19th century war games branched out along two directions — the rigid and free-forms, corresponding to imposing demands of realism and playability. As a consequence of the popularity of rigid and free varieties of war games in Prussia, such games rapidly spread to other countries during the latter part of the 19th century. Military games were introduced into the British Army in 1872. Shortly thereafter British games were copied by the United States at West Point.

In our own time several major military and political decisions were made after "gaming" the possible outcome.

Prior to the decision to engage in war with the United States, the Japanese military and diplomatic leadership engaged in a series of extremely ambitious war games, conducted at the Total War Research Institute and the Naval War College of Japan. Robert D. Specht, in an article entitled "War Games," gives the following summary of these activities:

> Here military services and the government joined in gaming Japan's future actions: internal and external, military and diplomatic. In August 1941, a game was written up in which the two year period from mid-August 1941 through the middle of 1943 was gamed, was "lived through" in advance and, of course, at an accelerated pace. Players represented the Italo-German Axis, Russia, United States, England, Thailand, Netherlands, East Indies, China, Korea, Manchuria, and French Indochina. Japan was played, not as a single force, but as an uneasy coalition of Army, Navy, and Cabinet, with the military and the government disagreeing constantly — on the decision to go to war, on X-day, on civilian demands versus those of heavy industry, and so on. Disagreements arose and were settled — in the course of an afternoon, at the pace of this game — with the military group, by the way, as the more aggressive one, winning arguments.
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> Measures to be taken within Japan were gamed in detail and included economic, educational, financial, and psychological factors. The game even included plans for the control of consumer-goods, incidentally, which were identical with those actually put into effect on December 8, 1941.[14]

Goldhamer and Speier point out that as early as 1929 the German military and diplomatic corps engaged in political-military gaming regarding Germany's relations with Poland. This game included variables such as the Polish and German foreign ministers, League of Nations, and other significant states.[15] The Germans, according to avail-

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[14]Robert D. Specht, "War Games," P-1041, The Rand Corporation (March 18, 1957), p. 7; cited in K. J. Cohen and E. Rhenman, "The Role of Management Games in Education and Research," *Management Science*, Vol. VII, (January, 1961), p. 133.

[15]H. Goldhamer and H. Speier, "Some Observations on Political Gaming," in M. Shubik (ed.), *Game Theory and Related Approaches to Social Behavior* (New York: John Wiley & Sons Inc., 1964), p. 262.

[16]See H. Guetzkow, "A Use of Simulation in the Study of Internation Relations," in M. Shubik (ed.) *Game Theory and Related Approaches to Social Behavior* (New York: John Wiley, 1964), pp. 273-82.

able evidence, seem to have planned and prepared for both the Western campaign and "Operation Barbarossa" against Russia with war games.

In the offices of the Pentagon, in the research laboratories of government sponsored "think-plants" such as the Rand Corporation, and in social science departments of major universities, people are developing and playing such games as "Cold War,"[16] "Political Exercise,"[17] "Colonel Blotto,"[18] and the Internation Game."[19] Decision makers with the power of life and death over civilization, are attempting to gain understanding and prepare for future contingencies through the vehicle of gaming.

It might be mentioned that some efforts are being directed toward developing games concerned with the pursuit of peace.[20]

The Development of Business Games

The first widely known business game was created by the American Management Association in 1956. The AMA unequivocally pointed out its indebtedness to military war games.

> In the war games conducted by the armed forces, command officers of the Army, Navy and Air Force have an opportunity to practice decision-making creatively in a myriad of hypothetical yet true-to-life competitive situations. Moreover, they are forced to make decisions in areas outside their own speciality: a naval communications officer, for example, may play the role of a task force commander.

> Why then, shouldn't businessmen have the same opportunity? Why shouldn't a Vice-President, say, in charge of advertising, have a chance to play the role of company president for fun and for practice? Why not a business "war game," in which teams of executives would make basic decisions of the kind that face every top management — and would see the results immediately?

> From these questions grew the AMA Top Management Decision Simulation. After an exploratory visit to the Naval War College, a research group was formed, and work began on a game which would eventually become part of an AMA course in decision making. This, in turn, it was hoped might lead to a sort of "war college" for business executives.[21]

Since 1956 there has been a great proliferation of business games of many types. The AMA does not seem to have a convention without one or more of these games being used. Major business faculties have also been deeply involved. Several important industrial corporations (Westinghouse, Pillsbury, IBM, and many others) have developed a series of games for their own internal purposes.

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[17]*Ibid.*, pp. 273-82.

[18]J. McDonald and J. W. Tukey, "Colonel Blotto: A Problem of Military Strategy," *Fortune* (June, 1949), p. 102.

[19]Guetzkow, *op. cit.*, pp. 273-82.

[20]Lloyd Norman, "Games of Peace," *Newsweek* (January, 1964), pp. 56-57.

[21]Franc M. Ricciordi, *et al.*, *Top Management Decision Simulation: The AMA Approach*, Elizabeth Marting, editor (N.Y.: AMA, 1957), p. 59.

The example of military utilization was not alone in accounting for business adoption of gaming. At least three other factors deserve mention. First, the advent of sophisticated computer technology enabled game designers to include many more variables in their models, thereby approaching realistic situations.

Second, game theory is a branch of mathematics focusing on social situations, such as conflict. Martin Shubik suggests the following definition:

> Game theory is a method for the study of decision making in situations of conflict. It deals with human processes in which the individual decision-unit is not in complete control of other decision-units entering into the environment. It is addressed to problems involving conflict, cooperation, or both, at many levels. The decision-unit may be an individual, a group, a formal or an informal organization, or a society. The stage may be set to reflect primarily political, psychological, sociological, economic or other aspects of human affairs.[22]

The important point to stress is that most mathematics prior to World War II were not relevant to the social sciences. The late 1940's saw the evolution of mathematical forms developed for analyses in the social sicences, including the game theory. A host of useful concepts has been refined by game theorists including, *payoffs, strategy, rationality, coalition,* and *zero-sum game.* I would like to define the latter term in that it has some bearing on the theory of bargaining. A zero-sum game is one of pure opposition. The amount that one player loses is equal to the amount his opponent wins. (e.g., 2-handed poker, duels, search and pursuit games.)

T. C. Schelling, one of the outstanding academic strategists or civilian militarists, has developed a game emphasizing elements of bargaining that tend to exist in conflict situations.

> The fundamental idea is that war — whether a "fighting" war or a process of strategic maneuver — is not a zero-sum game. It requires at least some cooperation or accommodation between the two sides. It is a "bargaining situation," in which the conflict and the interdependence are inseparable.[23]

Finally, increased competitiveness in business is also cited as a factor encouraging the adoption by business of gaming and simulation techniques.

Educational Games

It has been pointed out that to date the major employment of gaming has been in the area of teaching but not in the school context. It has been primarily employed as a device for the development of decision making skills on the part of military and business leaders.

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[22]Martin Shubik (ed.), *Game Theory and Related Approaches to Social Behavior* (N.Y.: John Wiley and Sons, 1964), p. 8.

[23]T. C. Schelling, "Experimental Games and Bargaining Theory," in M. Shubik (ed.), *Game Theory and Related Approaches to Social Behavior*, pp. 315-16.

For convenience it is possible to categorize gaming developments in education under three headings: classroom games; administrative training games; and teacher training games.

Classroom games. The social studies perhaps more than any other curricular area has manifested a marked interest in the use and development of teaching games.[24] Maish and Peryon[25] have developed a political game for high school history students as a culminating activity for the period following World War II. John D. Gearon has developed social studies games in the area of international relations[26] and labor management conflicts.[27] The "Wiff 'n Proof" games for thinkers series has developed a game for the analysis of propaganda.[28] A number of economic games have been developed including the well known Sumerian Game.[29] Boocock and Coleman[30] at Johns Hopkins University have developed a series of games with social learning functions. They have pointed out certain structural defects in North American secondary education including:

> . . . a mismatching of time, a rigid reward system, and over-emphasis on the "judging" aspect of the teacher's role.[31]

Coleman cites two premises underlying his interest in gaming and simulation as a means of remedying these structural defects:

1. Persons do not learn by being taught; they learn by experiencing the consequences of their actions. Games which simulate some aspects of reality are the one way a young person can begin to see such consequences before he faces the real actions and the real consequences as an adult.

2. . . . schools find it difficult to teach about the complexity that characterizes modern society . . . The games we and others have created present the student with an approximation of certain facets of modern society that he will have to face later.[32]

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[24]L. W. Ingraham, "Teachers, Computers, and Games: Innovations in the Social Studies," *Social Education,* Vol. XXXI (January, 1967), pp. 51-53. This article includes a detailed bibliography of gaming and simulation in the social studies area.

[25]David L. Maish and Robert E. Peryon, "A Political Game for History Students," *Bulletin of the NASSP,* Vol. 51 (Dec. 1967), pp. 22-30.

[26]John D. Gearon, "War of Peace: A Simulation Game," *Social Education,* Vol. XXX (Nov., 1966), pp. 521-22.

[27]John D. Gearon, "Labor vs. Management: A Simulation Game," *Social Education,* Vol. XXX (Oct., 1966), pp. 421-22.

[28]*Wiff 'n Proof,* (Box 71, New Haven, Conn.), "The Propaganda Game," by R. W. Allen and L. Greene.

[29]Bruse Moncreiff, "The Sumerian Game: Teaching Economics with a Computerized P.I.," *Programmed Instruction,* 4: 1965.

[30]Sarane S. Boocock and James S. Coleman, "Games with Simulated Environments in Learning," *Sociology of Education,* Vol. 39 (Summer, 1966), pp. 215-36.

[31]*Ibid.,* p. 215.

[32]James S. Coleman, "Learning Through Games," *NEA Journal,* Vol. 56 (Jan., 1967), p. 70.

J. M. Phillips[33] and Donovan Johnson[34] have written on games for the new and old mathematics. Wiff 'n Proof[35] has turned out a number of commercial games in the mathematics area on set theory, equations, and symbolic logic.

In the area of science, Mier,[36] at the University of Michigan, has developed a game called "Wildlife" which attempts to illustrate the interactions of an ecosystem.

Administrative games. Foremost among simulations developed for training school administrators is the in-basket technique. This device was originally developed as a research tool for the study of administrative behaviour. Norman Frederiksen and others devised an in-basket test for studying the administrative performance of USAF officers.[37] Frederiksen believed the technique would be useful in studying administration in other forms of organization. With John K. Hemphill and Daniel E. Griffiths, he developed a proposal for the study of educational administration. A number of foundations, universities, governmental agencies, and educational organizations provided funds for the research. An outgrowth of this project was four in-basket cases applicable to educational administration. Hemphill, Griffiths, and Frederiksen describe this approach in the following terms:

> One of the more important means employed to simulate administrative tasks was the *in-basket test*. Everyone is familiar with the baskets or trays that administrators generally have on their desks to keep incoming and outgoing correspondence separate. An in-basket test is a collection of items which have presumably accumulated in the in-basket of an administrator and are awaiting his attention. These constitute the test items, and the action which the administrator takes with respect to them are his responses to the test.[38]

Professors of educational administration saw in this device a means or a tool for the training of administrators or administrative aspirants. In-baskets for teaching or on the job training were developed.[39]

Joan A. M. Davis, now at the University of London, learned of the Frederiksen, *et al.* in-basket while at the University of British Columbia. She developed a British version entitled "Linden Junior School,"[40] for

[33]J. M. Phillips, "Games for the New Math," *The Instructor*, Vol. LXXVII (Dec., 1967), pp. 89; 104; 108-109.

[34]Donovan Johnson, *Games for Learning Mathematics* (Portland, Me.: J. W. Walch, 1960).

[35]*Wiff 'n Proof, op. cit.*

[36]Richard L. Mier, "Wildlife," Department of Conservation, School of Natural Resources, University of Michigan, Ann Arbor (Dec. 1961).

[37]Norman Frederiksen, D. R. Saunders, and Barbara Ward, "The In-Basket Test," *Psychological Monographs*, vol. 71, No. 9, 1957.

[38]John K. Hemphill, Daniel E. Griffiths, and Norman Frederiksen, *Administrative Performance and Personality: A Study of the Principal in a Simulated Elementary School* (New York: Bureau of Publications, Teachers' College, Columbia University, 1962), p. 8.

[39]Kenneth E. McIntyre, *Selection and On-the-Job Training of School Principals* (Austin: University of Texas, 1960).

[40]Joan A. M. Davis and William Taylor, "Teaching the Head: Simulated Management," *The Times Educational Supplement*, June 12, 1964, No. 2560:k524.

the training of United Kingdom headmasters. K. G. Collier and William Taylor[41] of Bristol University developed a second British simulation entitled "Problems of Authority in Schools," also employing in-basket organization.

American School administrators are currently very concerned about teacher militancy and a new game has been developed emphasizing the skills of labor negotiation.[42]

Teacher training simulations. Professor F. W. Broadbent[43] of the State University of New York has developed a two-week simulation of a grade five classroom. His format basically follows the in-basket technique with feedback elements included. Some 32 problem areas have been isolated in the simulation. The student-teacher is introduced to these through filmstrips, audio tape recordings and a faculty handbook. The student assumes the role of a first-year teacher in grade 5 at Longacre school. Broadbent offers the following rationale for his approach:

> Basically, simulation is the building of a model and having participants operate it according to selected rules. This technique offers many advantages to teacher education programs:
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> 1. It provides practice that would be too costly or unavailable otherwise.
> 2. Controlled feedback can be added to practice sessions.
> 3. The model can be simplified and tasks can be programmed from simple to complex.
> 4. The high involvement of participants results in greater motivation and learning.
> 5. Simulation provides involvement in a special role or in many roles in the same organization.
> 6. Since experiences are selected by the designer, negative or harmful experiences can be eliminated.[44]

B. Y. Kersh[45] of the University of Oregon has developed a classroom simulation using film which presents critical incidents and provides for differential feedback to students contingent on their responses to the incident.

III. FUNCTIONS AND TYPES OF GAMES

Areas of Application

Professor Allen Feldt of Cornell University has suggested four possible types of application and utility for gaming devices. These are:

[41]*Ibid.*

[42]John J. Horvath, *Professional Negotiations in Education: A Bargaining Game* (Prototype edition; Columbus, Ohio: The University Council for Educational Administration, 1966).

[43]Frank W. Broadbent, "Simulating Problems of Beginning Teachers," *The Elementary School Journal*, Vol. 68 (Oct., 1967), pp. 39-43.

[44]*Ibid.*, pp. 39-40.

[45]B. Y. Kersh, cited in F. W. Broadbent, *op. cit.*

1. as experimental instruments in the study of learning behavior
2. as highly elaborated and specialized teaching machines
3. as mechanisms and models aiding in the codification development and testing theoretical research
4. as supposedly accurate and trustworthy mechanisms capable of arriving at decisions and outcomes of elaborate and complicated processes of interest to persons utilizing the game in question.[46]

The first application is unfamiliar to this writer though it might be pointed out that a number of games have been developed at the University of Michigan to examine questions of learning behaviour.

The second item deals with gaming as a teaching device, often cited in the literature as games which focus on the development of an understanding at a specific functional level. These might include, in business, games dealing with marketing or production; and, in education, possibly the development of supervisory skills or an understanding of curriculum development. The second goal of educational games is to develop an understanding of the interrelationship of various functions and parts of an organization. Finally, the development of decision making skills is often cited as a purpose. The first two of these purposes would deal with, for the most part, lower and middle management levels of an organization, whereas the third would tend to be the concern of top managers.

Feldt's third form of application, research, has not hitherto reached a very high stage of development. The possibilities, however, seem to be almost unlimited. Models of the economic system, organizational theory, and from the behavioral sciences offer many areas in which new theoretical development can be explored. Gueztkow at Northwestern University has, for the past few years, been attempting to develop hypotheses about international relations through observations of the *Internation Game* which he developed.

Feldt's final application is well illustrated by the military, political examples of Japanese and German actions preceding World War II. This pattern is also illustrated by some of the current strategic thinking being developed by academic strategists. A new application has been evolving in recent years regarding city planning and urban renewal. Feldt, himself, and other scholars in the area of urban studies, have been developing simulations, notably CLUG — The Cornell Land Use Game,[47] to enable municipal planners to take into account various constraints and limitations in the field. Potentially, this usage has considerable relevance for top administrators in education, especially in rapidly growing urban areas as Calgary and Edmonton in the Canadian West. It is necessary for educational leaders not merely to be putting out

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[46] Allan Feldt, "Some Thoughts and Speculations on the Development and Use of Games in Teaching and Research," Fall, 1962, Mimeographed, p. 1.
[47] "Games Executives Play," *Newsweek* (Nov. 27, 1967), p. 86.

fires, but to project trends and anticipate future needs. Research on the diffusion of educational ideas and practices tends to support the conclusion that most schools are twenty-five to fifty years behind the best prevailing practice.

Types of Games

At this point it might be useful to say a few words about some of the types of games which have been heretofore developed. Thorelli and Graves in their introduction to gaming have done as well in this area as perhaps anyone. Their taxonomy deals with the following five categories:

1. special purpose
2. level of management
3. individual versus group decision making
4. interactive versus non-interactive
5. manual versus computerized.[48]

By specific purpose games they refer to an emphasis on content over process. Games dealing with production scheduling, inventory control, or logistics would be illustrative. The function of special purpose games is often to train students in the use of a specific problem solving technique such as the application of a given inventory control formula. The United States armed forces have developed games to teach electronics technicians to trouble shoot electronic breakdowns in large and complex electronic systems.

Level of management games can be subdivided into three categories: general management directed towards aspirants or incumbents in top management; functional games directed towards the sphere of middle management; and sub-functional games (which would tend to be highly specific) aimed at middle and junior management levels.

There are instances where games are played by competing individuals; however, these seem to be the exception rather than the rule. Most games known to this writer have tended to emphasize group decision making processes.

By interactive, or non-interactive games, Thorelli and Graves refer to competitive games as examples of the first type, such as those which would include a market. Certain scheduling, or administrative technique games are non-interactive unless viewed as being in competition with self and surpassing one's previous performance as in golf.

Finally, games may also be classified as manual or computerized. There are advantages to both forms, depending upon the purpose of the designer. It is evident that with computers, a greater degree of com-

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[48]Hans B. Thorelli and Robert L. Graves, *International Operations Simulation* (Free Press of Glencoe, 1964), pp. 9-12.

plexity is possible. On the other hand, manual games tend to be low cost and can perhaps perform highly specialized purposes more effectively than computer games.

IV. Pro and Contra

Areas of Effectiveness

Several claims made on behalf of gaming merit consideration. A very obvious one is that games are generally fun to play, and thus are able to hold the players' attention for prolonged periods. As a teaching device this has advantages in that lengthy preparation need not be taken to develop motivation. Related to this is the tendency for players to become emotionally involved. A rather apt illustration of the intensity of this involvement is provided by Craft and Stewart:

> Everyone who attended that first (AMA Business Game) course took the simulated exercise very seriously. They put in long hours, frequently ignoring the scheduled break periods. . . . Two members of one team almost came to blows over the company strategy, and had to be stopped by their president.[49]

Another point frequently made is that games provide a semi-real situation in which decisions can be made but the costly consequences of erroneous decisions are avoided. For example, players in business games can make decisions which may involve the loss of millions of dollars, or military decision makers can make disastrous decisions involving great losses in personnel and material, but these consequences are not "for real."

An oft-cited worthwhile feature of the gaming situation is the built-in "feed-back" which compels players to consider the consequences of their actions. This can perhaps be best illustrated by comparing the game to a case. The case is essentially a static snapshot of an organizational problem situation. The game has been described by one writer as being "a dynamic and live case."[50] When a player in a gaming situation decides upon a course of action, i.e., when he makes a decision, something happens as a result. He either receives some payoff which improves his position *vis-à-vis* other players, or, he must make another decision to rectify any disadvantages which have occurred. Cases on the other hand do not have this built-in feed-back feature.

Also claimed on behalf of gaming as an advantage is the development of a holistic view. The gaming situation provides opportunities to understand the interrelationships of various parts of the organization and the outside world. It helps the player to understand the larger picture. People, very involved in their own particular departments, are enabled to appreciate the relevance or contributions of other branches of the organization.

49Clifford J. Craft and Lois A. Stewart, "Competitive Management Simulation," *The Journal of Industrial Engineering*, Vol. 10, No. 5 (Sept.-Oct., 1959), p. 358, cited in Cohen and Rhenman.

50Thorelli and Graves, *op. cit.*, p. 26.

Criticisms of Gaming

Perhaps the most repeated criticism of gaming lies in the difficulty to test or measure the learning of the players. It is very difficult for people involved in the design and use of games to distinguish bad games from good ones. This, however, can also be said of the number of older and more accepted teaching techniques, such as cases, group discussions, role playing, and even lectures. Proponents of gaming are well aware of these criticisms and short-comings and do suggest that a considerable amount of work needs to be done on the development of measuring instruments. Also, studies need to be carried out on the effectiveness of students performing in real life situations. Secondly, there exists a danger of dysfunctional learning. Games are necessarily simplifications of real life situations and a tendency to over-simplify in a realistic context could be calamitous when there are many more variables in operation. There is also the factor of opportunity-cost, by which is meant that in order to play a game one gives up doing something else which may or may not be more valuable. Nobody's time is completely worthless, and this has to be taken into account. There are also the economic costs to be considered. The construction of, and the playing of games involve time and can involve considerable expenditure, depending upon the complexity desired. There may be alternative ways, or mechanisms, which could carry out more economically the purposes one hopes to achieve by the use of gaming.

V. Conclusion

An effort has been made in this presentation to survey some of the thinking and doing in the area of gaming and simulation. In the thinking portion some of the provocative conceptualizations of Huizinga, Caillois and others has been briefly examined. An attempt was made to trace the evolution by practitioners of gaming in war, business, politics, and education. Some of the forces encouraging the current interest in and utilization of games such as computers, game theory, bargaining theory, and business conditions were discussed. The applications of gaming formulated by Feldt were analyzed. The Thorelli and Graves taxonomy of games along with arguments for and against the use of gaming devices were also examined.

Professor J. S. Coleman has summarized the forces contributing to the challenge and the opportunity offered by simulation and gaming in the following manner:

> In the broadest sense, the development of academic simulation games is a response to two challenges: that posed by a complex, difficult to understand society and that posed by children uninterested in or unprepared for abstract intellectual learning. These challenges may be blessings in disguise if they force the development of approaches to learning in school that most nearly approximate the natural process through which learning occurs outside school.[51]

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[51]J. S. Coleman, *op cit.*, p. 70.