

ON THE PERSON AND THE WORK OF THE ENTREPRENEUR

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The economic function of the entrepreneur signalizes [the] irreducible paramount importance of the human person (Dempsey, 1958, p. 361).

Surely nothing in Joseph Schumpeter's writings is more familiar and more commonly mentioned than his "creative destruction." Arguably the term is as well known as Adam Smith's "invisible hand." One central difference between the two, however, is that creative destruction is a real economic actuality. The invisible hand is a manner of speaking.

Schumpeter to the contrary notwithstanding, this author is convinced that Dempsey was absolutely right: innovation is an essentially personal matter. For that reason, entrepreneurship cannot be bureaucratized.

This essay is divided into two main parts: the person of the entrepreneur and the work of the entrepreneur. The first part on the person of the entrepreneur is theoretical and speculative, suggesting a few postulates. This part is split into three sections. The first two sections address the person of the entrepreneur in the context of organizing the economy and the circular flow. The third and most venturesome section examines the person of the entrepreneur in the context of human sexuality.

The second main part of this essay discusses the work of the entrepreneur. This part is descriptive and anecdotal in which six private Louisiana companies are presented that have achieved notable success with specific innovations during the 1980s and 1990s. Connecting these two main sections is the simple proposition that what the entrepreneur does is a powerful determinant of who he/she is. And vice versa.

The author's views have been shaped and formed powerfully by a personalist philosophy and by Aristotelian causality. Both, in turn, influenced the way in which the person of the entrepreneur is represented in the first main part and the companies that are included in the second part along with how company information has been presented and emphasized.

THE PERSON OF THE ENTREPRENEUR

In the Context of Organizing the Economy.

A market economy is organized around the four economic processes of production, distribution, exchange, and consumption, each of which performs a specific economic function: transforming resources into goods and services; moving them through space and time; transferring ownership of those goods and services; and using them to satisfy human physical wants and to meet human physical needs. In addition, a market economy performs one other major function: providing employment opportunities to meet the need for work as such. Taken together, human physical wants/need and the need for work as such are the two aspects of human material need which constitute the ultimate purpose of any economic system and for that reason also constitute the main subject matter of economics.

Most fundamentally, there are two principal types of economic resources: human beings and nature. Correspondingly, the undesirable effects of a market economy are classifiable in terms of human beings and nature. Natural resource utilization depletes nature's endowment, permanently in the case of nonrenewable resources, and thereby constrains future production. Inefficiency and indifference mean that across the four processes both types of resources are wasted and, even though some material waste is recyclable, a portion of the nonrecycled waste is hazardous to humans and other living things. The imperfections of human beings mean that other hazards are encountered throughout the four economic processes and their associated functions. Further, in a market economy resources are not always fully utilized and idled resources reduce personal earnings. A loss of earnings, in turn, likely signals unmet human material need along one of its two broad dimensions: physical wants/need.

The main work of the social economist may be defined in terms of depleted and wasted resources, hazardous waste, the risks incurred in the four economic processes and functions, and idled resources. At the same time, however, unmet human material need is instrumental in resource (re-)allocation in a market economy in that the hardship which attends such unmet need forces workers and other resourceholders to look elsewhere for employment opportunities and to respond more or less promptly to the offers that are available. Thus, resource (re-)allocation comes about as a consequence of two distinct forces: the "push" of unmet human material need and the "pull" of relative prices.

In a market economy the social economist faces the dilemma of addressing unmet human material need in the certain knowledge that too much unmet need destabilizes the entire social-economic-political order and too little disrupts the "push" force driving resource (re-)allocation.

Competition, which is a disposition on the part of the individual to perform certain tasks through individual action, motivated by individual economic incentives, is one of two organizing principles that activate the four processes and the five economic functions. The other activating or energizing organizational principle is cooperation, which is a disposition on the part of the individual to undertake certain tasks through collective action because the task cannot be completed through individual action alone. The third organizing principle of intervention limits individual and collective action in order to prevent, remedy, or contain the undesirable consequences.

Each one of the three organizing principles is grounded in a specific social value. Competition rests on the social value of individual freedom, cooperation depends on the social value of community, and intervention is built on the social value of equality. Each of the three social values, in turn, is supported by a specific principle of economic justice. Equality is grounded in the principle of distributive justice which helps eliminate the favoritism that makes some persons more equal than others. Community is based on the principle of contributive justice which requires every member to contribute to the support of the community. Individual freedom is rooted in the principle of equivalence, which restrains one party to an economic exchange from imposing the terms of that exchange on the other. Ripping off, discrimination, and the destruction of community are three consequences of inadequate attention to the demands of these three principles of economic justice.

A market economy is continuously changing in response to the driving energy of the entrepreneur. In Aristotelian terms, the entrepreneur is the efficient cause of change in the economic

order. This change is at once creative and destructive: creating new goods and services and processes of production and destroying old ones; utilizing new or different materials in the process of production and casting aside old materials; opening up new markets at the same time closing down or moving out of others; developing new methods for organizing economic enterprises and scraping older organizational forms.

Being at once creative and destructive, entrepreneurial change disrupts economic processes improving at least temporarily economic security for some persons and undermining security for others. The impact on the person is both direct and indirect. To illustrate, on the destructive side, a major change directly affects those who become disemployed and indirectly influences those whose trade depends on the disemployed.

Entrepreneurial change has profound institutional as well as personal consequences. Of particular concern herein are the effects that innovation has on such economic institutions as the union, the company, and the neighborhood because these are the institutions upon which individual persons rely first to help them provision material need.¹ Disruptions in these first-line support systems are likely to help trigger changes in the three social values (freedom, community, and equality) that underpin the three organizing principles of competition, cooperation, and intervention. Clearly, for instance, the gradual deterioration of an entire neighborhood due to the demise of strip shopping or the collapse of a large private company due to its inability to develop new products successfully may lead to wider support for intervention and equality and less for competition and freedom. Entrepreneurship, in other words, can have economic impacts on persons and institutions that are seismic-like in nature and scope, forcing a re-examination of the very foundations of the economic order.

In the Context of the Circular Flow.

Students familiar with his *The Theory of Economic Development* know that Schumpeter used the concept of the circular flow to explain how a market economy operates:

How much meat the butcher disposes of depends upon how much his customer the tailor will buy and at what price. That depends, however, upon the proceeds from the latter's business, these proceeds again upon the needs and the purchasing power of his customer the shoemaker, whose purchasing power again depends upon the needs and purchasing power of the people for whom he produces; and so forth, until we finally strike someone whose income derives from the sale of his goods to the butcher. This concatenation and mutual dependence of the quantities of which the economic cosmos consists are always visible, in whichever of the possible direction one may choose to move. Wherever one breaks in and wherever one turns from this

¹ Entrepreneurship, for sure, influences the economic fortunes of cities, regions, and nations, but we are less concerned herein with these types of transformations because all three of these institutions are further removed from the individual person than the union, the company, or the neighborhood and, therefore, are less likely to affect personal economic insecurity.

point, one must always, after perhaps a great but a finite number of steps, return to the starting point (Schumpeter 1983, p. 7).

For our purposes there is one element in Schumpeter's exposition of the circular flow that is especially noteworthy and calls for underscoring. Schumpeter represented economic life in terms of real persons -- the butcher, the tailor, the shoemaker -- rather than things or abstractions. In Aristotelian fashion, he argues that economy does "not change 'of itself'" (Schumpeter 1983, p.9). Clearly, what he has in mind is that things may be formal causes or material causes, but never efficient causes, for such things as earthquakes, droughts, and the like may have serious consequences, but they do not change the economic structure. Furthermore, what he means is that the economy is not a static system continuously in equilibrium as represented by the circular flow or even a comparative static one of adaptive response but rather a dynamic set of processes and functions tipped into disequilibrium by the efficient cause, a human being.

It is possible and instructive to represent the role of the entrepreneur in the context of the circular flow provided specific human agents or persons are substituted for the more familiar household, business, and government sectors of the conventional circular-flow diagram. Four human agents are highlighted introspectively: the entrepreneur, the banker, the consumer/worker, and the public official. The energizing action of the representative entrepreneur is visualized on both sides of the product market, on the demand side of the resource market, and on the demand side of the financial market.² One drawback is that this intuitive representation it does not include entrepreneurship taking place in the workplace. In the next section, an effort will be made to demonstrate that the masculine entrepreneur is better oriented toward the marketplace; the feminine entrepreneur's orientation is toward the workplace.

To the conventional circular flow may be added streams of waste generated by three principal sources -- the business sector, the household, and the government sector -- and a stream of recycled waste to supplement new resources directly from nature. These streams or flows, which are a serious and perplexing problem for any economy, are missing from conventional circular flow analyses.³ Further, this conception stresses the opportunities for entrepreneurship in handling waste materials. In the second main section of this essay, two of the companies that are reported have innovated different methods for rendering hazardous waste either harmless or re-usable.

In the Context of Sexuality.

Human sexuality plays a centrally important role in competition, cooperation, and entrepreneurship. Competition, as Walter Ong states, is close in meaning to contest.

"Competition" lies closer to "contest" than "conflict" does since it also suggests interaction between conscious beings. But it is more specialized in meaning because

²A financial entrepreneur would be represented as functioning on the supply side of the financial market. A copy of such a rendering is available from the author upon request.

³A social economist who does include these flows is Herman Daly (cf. Daly, 1985, pp. 279-97).

it involves acquisition of something in addition to mere victory, generally of something more or less tangible. Competition is more like work, ordered to something definite outside itself, whereas contest is more like play, which has its own justification. One competes "for" something, but one need not contest "for" something: what is essentially at stake is simple success in the contest, "winning." Still, these terms "competition" and "contest," are close (1981, p. 43).

Males engage systematically in contest, Ong argues, in order to differentiate themselves from females, notably to establish a clear difference between themselves and their mothers (1981, p. 66). In this regard, males are driven biologically and psychologically to discover and affirm their masculinity, their authentic individuality. Biologically, the male embryo must manufacture testosterone from its own gonads in order to develop anatomically in a uterine environment which circulates maternal hormones. That is, to assure its masculinity, the male embryo must react against its environment by hormonal differentiation. At the same time, no such hormonal differentiation and environmental reaction is required of the female embryo because the formation of the female genital tract proceeds without hormonal differentiation. In other words, female embryos are entirely safe in an environment of maternal hormones, but male embryos are not (Ong, 1981, pp. 64-65).

Psychologically, male differentiation continues after birth because, given his maternal environment, the young male in many ways is feminine. Interference with his separation from his mother can produce transsexualism or transvestism. Males, according to Ong, are driven to create stress situations peaking in the mature male with sexual intercourse. Given his biological and psychological insecurity, the male's vocation is not to accept absorption into the female sex but to alter the environment, to change things. In contrast, the work of the female is to incorporate, to harbor, to keep (Ong, 1981, pp. 65-67, 71, 102).

Males are more likely to be risk takers because biologically they are the expendable sex. Women are more self-satisfied, whereas men are restless and dissatisfied. Thus, men are more likely to be agents of change. Further, men more so than women are loners. It is freedom that the male craves, and for him the ultimate accomplishment and happiness is the symbolic independence from all environment achieved by setting up as a loner, with occasional participation in a "bonded gang of loners" (Ong, 1981, pp. 69, 82). It is through rough and tumble contests in the political, economic, and academic orders and in the world of sports that the male proves his masculinity, that is proves to himself that he is not female (Ong, 1981, pp. 86, 98).

The older male addresses his urge to violence by placing that violence at the service of others.⁴ The older female counters her drive to possessiveness by surrendering to others her dearest. The classic female is the Pieta; the quintessential male is Don Quixote (Ong, 1981, pp. 102-03).

⁴ Is it some failure to express this violence through entrepreneurship and thereby mature as an adult male person which helps explain the increased criminal violence in the streets across the U.S.? Is this failure a problem particularly for black males in the U.S.? In this regard, Grambling State University is located in the Town of Grambling (LA) which in 1990 had a population of 5,484 more than 95 percent of whom are black. The University has a student body of approximately 7,500 and employment (including faculty) in excess of 1,000, almost all of whom are black. Many of the employees hold professional positions requiring substantial educational credentials, intelligence, and skills, and providing comfortable living standards. Additionally, the student body itself represents a large consumer market. Given these economic resources and opportunities,

In what at first glance appears an oddity, Ong states that the world of commerce tends more toward the feminization of culture than its masculinization (Ong, 1981, p. 166). In the context of his other observations, along with our own understanding of the economic order, we take his remark to mean in effect that the various economic processes and functions are energized more so by cooperation, which to Ong is a feminine trait, than by competition, which to him is a masculine characteristic. In this regard, Ong is consistent with Marshall who asserted that it is cooperation more so than competition that drives economic affairs (1948, p. 5).

For our purposes, it is especially instructive to take note that Ong refers to the male who counters his urge to violence by putting it at the service of others as the "knight errant" (Ong, 1981, p. 102) and to recall that Schumpeter refers to the entrepreneur as the "armored knight" (1950, p. 133). We postulate, therefore, that the male engages in entrepreneurship significantly as a way of differentiating himself psychologically from the female and for that reason entrepreneurship cannot be completely bureaucratized as Schumpeter suggested (1950, p. 134).

Even so, it would be entirely misguided to argue that only males can become entrepreneurs. Interestingly, even when it has the effect of making the firm more competitive in the marketplace, entrepreneurship in the workplace relating specifically to the ways in which work processes are set up and the company is organized necessarily demands the use of cooperation which, following Ong, is a distinctly feminine characteristic. Thus, masculinity and femininity are intertwined functionally and organizationally in the business enterprise because more fundamentally they are intertwined biologically and psychologically in the human male and human female.

Additionally, we propose that males in whom masculinity overshadows femininity are driven by the social values of individual freedom more so than the value of community and in matters of entrepreneurship are competitive more so than cooperative and thereby are more oriented toward marketplace innovation. Men in whom femininity is stronger and women more generally in matters of entrepreneurship are more likely to act cooperatively as opposed to competitively and thereby are more oriented toward workplace innovation.

Based on evidence from 200 studies of male and female management styles, Candida Brush, assistant professor of management policy at Boston University, asserted that

women tend to be more cooperative, informal, consensus-building in their behavior. Men, in contrast tend to approach things in a more competitive, formal, or systematic way (Zellner et al., 1994, p. 105).

Gianna Goldman who several years ago launched a business that sells stylish photographic frames to retailers affirms Brush's findings.

why does Grambling have a rate of poverty of 39 percent, and why are there only 20 private business establishments operating with a Grambling address, the largest of which employs just 11 persons (U.S. Census Bureau and Louisiana Department of Employment Security)?

Women have been taught all their lives to nurture and support others. As entrepreneurs, we are really able to use our natural abilities to empower others in our own companies (Zellner et al., pp. 105-06).

These postulates are consistent with the larger numbers of women in the U.S. labor force in the past several decades in a wide variety of professional/managerial positions and with the increasing utilization of cooperation by U.S. firms as a means of surviving in an economic order which, due to the globalization of business and the collapse of command economies, imparts greater economic insecurity rather than less. This greater insecurity, in turn, could accelerate the pace of entrepreneurship in the years ahead along competitive lines. Thus, for the foreseeable future we anticipate heightened economic activity, more cooperation and competition, intensified entrepreneurship, and greater economic insecurity.

From the creative aspect of innovation, there are five general classes of entrepreneurship: (1) introducing a new good or service; (2) developing a new production process; (3) utilizing a new or different material in the production process; (4) opening up a new market; and (5) designing/implementing a new organizational model (Schumpeter, 1950, pp. 83, 132). We postulate that the skills for entrepreneurial activity derive significantly from and are determined importantly by a person's masculinity and femininity. Thus, we hypothesize that masculinity is a dominant driver for introducing a new good or service, utilizing a new or different material in the production process, and opening up a new market and that femininity is the governing force in developing a new production process and designing/implementing a new organizational model. As cliché as it may sound, predominantly masculine entrepreneurs are more oriented toward things. Predominantly feminine entrepreneurs, on the other hand, are more oriented toward human beings.

THE WORK OF THE ENTREPRENEUR

Because the entrepreneur is the efficient cause of change in a market economy, the person of the entrepreneur is revealed in part by the change that he/she brings about. Put differently, what the entrepreneur does is a powerful determinant of who he/she is. And vice versa.

This author presents below six companies which he has personally visited expressly for the purpose of reviewing and evaluating specific innovations which have achieved marketplace success.⁵ In that sense, the masculine side of the entrepreneur is revealed more so than the feminine side.

⁵ These visits were made with several other persons from the selection board in Louisiana which since 1988 has recommended one firm in the State for the U.S. Senate Innovation Award.

*John Chance & Associates*⁶

The John Chance (JC) family risked the future of a company that had been operating successfully for nearly 30 years in order to develop a more accurate positioning technology which would allow JC to cut the cost of its services to its clients and without which it would not have been able to survive the crisis in the U.S. oil-producing industry during the mid 1980s.

JC began in 1957 as a family-owned and operated, oil-related, land-survey business and later branched into survey work offshore, helping to position drilling rigs at a precise location pre-determined by geoscientists to increase the probability of striking oil. Over the years, JC grew and developed until in 1983 it dominated the positioning-system market in North America. By 1984, however, after the price of crude oil had dropped sharply, it became clear at JC that there was a need to develop a more accurate positioning technology which would reduce their customers' cost to put a rig in a pre-determined location in the Gulf of Mexico.

At that time, the founder decided to gamble on STARFIX, a satellite-based positioning and navigation technology. All of the \$8 million required to develop STARFIX was internally generated. Much of the success of the STARFIX project is attributable to Thomas Chance, one of the sons of the founder with a strong background in electrical engineering. An outside scientist also played a key role in developing STARFIX.

With STARFIX, JC is able to position a customer within five meters of a given off-shore position with 95 percent confidence. At the time it was first marketed in 1986, STARFIX was the only commercially available satellite-based system of its kind in the world capable of deep-seismic navigation (depths greater than 8,000 feet). STARFIX made JC a world-leader in the market by giving it a great technological advantage over its competitors. Its coverage, however, is limited to 500 miles off the coast of the U.S. because it utilizes four satellites in stationary geosynchronous orbit around the equator. Thus, JC's main market is technologically constrained to the Gulf of Mexico.

Strictly speaking, STARFIX is a black box. The hand-lugged instrument is manufactured and serviced by JC and leased to its customers. With STARFIX the company has been able to reduce the cost of its services to its customers by 15-60 percent. Company officials claimed that productivity on ships of the U.S. Geological Survey and National Oceanic and Atmospheric Administration has improved by 100 percent with STARFIX.

Additionally, JC operates a sophisticated computing center that gathers and stores detailed information about the floor of the Gulf and about above- and below-water structures, obstacles, and derelicts. The system allows the company to display the complete data set for any three square mile area in the Gulf in graphics form on a computer terminal. JC has been collecting and compiling this information since its establishment as a necessary part of its services in safely positioning its

⁶ From a site visit to the company headquarters in Lafayette LA in 1989.

customers and in assuring them that they can drill without fear of an unseen and unexpected obstacle such as a sunken ship or pipeline.

JC is an example of masculine-type entrepreneurship focused mainly on the marketplace and driven by competitive forces.

*Acadian Ambulance*⁷

Acadian Ambulance (AA) is a privately-held, for-profit company which has innovated a delivery system that energetically marshals and critically depends on resources from a variety of public and private institutions to provide affordable and professional emergency medical care to the residents of a predominantly rural area of service. The delivery system is AA's innovation.

AA began operating in 1971 at a time when ambulance services were characterized as "scoop and run." At that time, new federal regulations created a crisis in the area because private providers (many were funeral directors) were unable or unwilling to continue operating. The city and parish (county) public officials were hard pressed to add ambulance services as a public service supported by public funds.

Today, AA is the largest private ambulance service in the U.S. providing state-of-the-art emergency medical services in a predominantly rural 22-parish area that covers 14,610 square miles. It has more than 700 employees, 100 ground vehicles, 3 helicopters, and 1 fixed-wing airplane. AA staffs 38 stations in its service areas and 9 offshore medical platforms. In 1991 it served nearly 150,000 patients, and its ground vehicles rolled up 5.1 million miles.

AA was started by three young men using a private ambulance company in the Pennsylvania hometown of one of the principals as their model and enlisting the support of local public officials, a local bank, TV station, to sell annual memberships. Public officials were instrumental in persuading the TV station to allow AA free broadcast time to conduct a telethon to reach the public. The telethon has become an annual affair, but the broadcast time no longer is free. In addition, public officials persuaded a local bank to provide financing and to help collect the annual membership fees. That practice continues today with 80-90 banks and more than 300 collection points in AA's area of service. Throughout its entire history, these three men have provided the principal senior-management skills.

From the very beginning, AA has represented itself as a public service and, it seems, in the eyes of the public is perceived as a partner with the police and fire departments in providing reliable and trustworthy emergency services. AA has cultivated that image in a variety of ways. For example, the company details free of charge an emergency ground vehicle at athletic events and various fairs and festivals in its area of service. AA knows how to use the media to tell its story to the public and to highlight significant company and individual employee accomplishments.

⁷ From two site visits to the company headquarters in Lafayette LA in 1991 and 199

AA's principals claim that the company provides state-of-the-art, not leading-edge, emergency medical services. Even so, AA is innovational in the sense that the senior management has innovated an organization that delivers services that are perceived as a public service even though the company is privately-held, for-profit.⁸ Its books are open to examination by public officials in its service area, and in that regard AA is similar to an investor-owned public utility.

The delivery system, however, is much larger than AA alone. AA depends critically on resources and support supplied by other organizations and agencies -- some public, some private -- to deliver emergency medical services. To enumerate, it depends on area banks to collect its annual membership fees. AA has persuaded public officials and medical societies in cities and parishes in its service area to accept and promote AA as a public service provided by skilled and caring professionals. Three parishes have contracted directly with AA to supply ambulance services to all parish residents.

AA has worked closely with one state university in developing and funding associate degree courses to train emergency medical technicians and with the medical school of another to supply emergency medicine residents to enhance the quality of care on its helicopters. Through a lease agreement with a local helicopter service company, AA is able to use a small fleet of dedicated and specially-equipped helicopters with no direct responsibility for servicing and maintaining that fleet. And AA does not bear the entire burden of the cost of leasing the helicopters. Three area hospitals provide funds that make this service available. One helicopter is stationed at and dispatched from each of the three supporting hospitals.

AA is an example of feminine-type entrepreneurship focused mainly on the workplace and driven chiefly by the organizing principle of cooperation.

*Environmental Remediation*⁹

Environmental Remediation (ER) provides comprehensive remediation capabilities and services in the specialized domain of biodegradation. ER identifies, tests, manufactures, and supplies natural microorganisms which transform harmful substances into nontoxic compounds.

The company traces its origins to the establishment of Microbe Masters in 1982 which isolates, acclimates, manufactures, and markets naturally-occurring bacteria for use in treatment of industrial, municipal, and hazardous wastes. Later Environmental Solutions was established to provide general engineering services to clients with environmental and waste problems, and E.S. Industries was set up to address the need for water and waste treatment equipment. ER was formed

⁸ In 1993 AA started an ESOP for its workforce.

⁹ From a site visit to the company's facilities in Baton Rouge LA in 1992.

from these three affiliates.

At ER it takes three months to two years to turn a laboratory idea into a marketable product. The process is client-driven in that ER identifies on request the specific organism that renders into a nontoxic compound the specific waste generated by a client, such as creosote-contaminated soil.

Every new microorganism identified by ER is a potential innovation in the form of either a product, if it is sold directly to the client for application, or a service, if ER takes charge of the application. In two distinct but related ways ER is crisis-driven. First, the long-standing and very serious problem of contaminated water, soil, and solid waste has become a very costly chronic crisis across the entire U.S. Second, government regulations forcing a shutdown whenever a plant exceeds its permitted discharge creates an acute crisis for any private enterprise by virtue of the fines and loss of production if it cannot get its discharge within EPA permitted limits.

ER works closely with a microbiologist at a nearby state university who identifies and isolates the naturally-occurring microorganism that in effect uses a specific contaminant such as PCBs as a fuel source. This microbiologist, who is absolutely vital to the success of the company, has been an ER principal from the very beginning. Since ER does not produce or market microorganisms that are genetically-engineered, ER is able to patent the application and treatment processes it develops but not the naturally-occurring organisms which it sells.

There are two major groups in ER: product sales and remediation services. The product sales group is responsible for actually manufacturing the microorganisms. The main industrial customers are refineries, paper mills, and chemical plants. About 90 percent of product sales is used for waste water treatment.

There are 14-15 shelf products which ER routinely sells to various customers. ER also custom blends product from some 40-60 specific cultures for customers with a particular problem which cannot be addressed satisfactorily by one of the shelf products. Much of its industrial market is emergency response.

ER's remediation group offers several types of services to its clients, including permitting and agency negotiation, engineering services, and field management and remediation services. One of its largest bioremediation projects was cleaning a large sludge pit at an oil refinery site near Kansas City.

With its "bugs in a borehole," ER is able to treat contaminated soil under a structure such as a building or hardened surface such as an airport runway at a fraction of the cost of excavation, removal, transport, and incineration of that soil. In all of its contracts, ER is required to demonstrate that, after treatment, any contaminant(s) remaining does(do) not exceed EPA limits.

Given its emphasis on the marketplace, on identifying and manufacturing new products to meet the waste-disposal needs of its customers, ER exemplifies more nearly masculine- than feminine-type entrepreneurship.

*Edison Chouest Offshore*¹⁰

Edison Chouest Offshore (EC) is a high-tech, family owned and operated business specializing in the construction and charter of one-of-a-kind offshore marine service vessels. EC charters vessels of its own design, constructed in its wholly owned subsidiary to a variety of customers, such as the U.S. Navy, Johns Hopkins University's Applied Physics Laboratory, and Louisiana Offshore Oil Port. The company is the only shipyard in the U.S. which charters literally 100 percent of the vessels built in its shipyard.

The company began operations in the early 1960s with a father and two sons shrimping from a single boat. EC built its first boat in 1964 and opened its shipyard in 1974. Today, EC is a genuine anomaly: high-tech and Cajun. "Cajun shipyard" means a company owned by Cajuns and employing Cajuns (mostly welders) who pride themselves on tackling problems unconventionally. "Cajun engineering" means that technical problems are handled more on the basis of experience than formal training in naval architecture or engineering.

The principal entrepreneur at EC is one of the founder's son, Laney, who earned a medical degree and shortly thereafter decided that shipbuilding would be more rewarding and challenging than medicine. More than anyone else this author has met over the years on such site visits, Laney Chouest comes closest to Schumpeter's characterization of the entrepreneur. Another son, Gary, is responsible for the company's financial affairs.

Laney more so than anyone else at EC is the efficient cause driving a company that with every ship built innovates a new set of custom-designed services for a customer. The company operates in this fashion not because of the demands of the market but because the family, Laney in particular, relishes the challenges of unusual projects that are especially challenging even for a Cajun shipyard.

The EC fleet contains 37 vessels all of which are crewed by EC personnel. Its customers have widely different needs and operate in climates and weather conditions as different as the Gulf of Mexico, North and South Atlantic Ocean, North Sea, Baltic Sea, Mediterranean Sea, and the Pacific Ocean. At the time of this author's visit, the company was building a 300 ft icebreaker-research ship for the National Science Foundation. The EC design calls for a crew of 22 members and provides accommodations and working space for a maximum of 37 polar scientists. The scientific work is to be under the supervision of a chief scientist who is designated to handle problems relating to that work, such as daily schedules.

In the Gulf of Mexico, EC is capable of servicing every phase of offshore oil exploration and clean up. With the addition of fire-fighting equipment to certain vessels engaged in this work, EC is capable of fighting major fires in the Gulf and, in fact, has supplied important assistance of this type to a oil tanker on fire off the Texas coast.

¹⁰ From a site visit to the company's facilities in Galliano LA in 1991.

The EC fleet includes four specially designed tractor tugs that service the Trident submarine base in King's Bay, Georgia. The design of these tugs is such that the propeller is located roughly amidship, providing much greater stability in towing operations. The propulsion unit is designed and manufactured by the German firm Voith.

EC provides seismic vessels that operate in the summer in the North Sea and at other times of the year in the Mediterranean and off the coast of the Congo. Routine servicing of the vessels is performed at various shipyards in their area of service.

Two EC vessels are under charter to the U.S. Navy near Heard Island, 2,550 miles southwest of Perth, Australia and are engaged in global-warming research. EC is interested only in unique work of this type for the U.S. Navy and has passed up opportunities for what is called "commodity work." In the San Diego area, EC operates under a charter to the U.S. Navy a special deep submersible support vessel. This project was the first real government proposal for EC. Today, EC is the largest supplier of special vessels for the U.S. Navy.

Following Ong's description of the male who is required to differentiate himself from the female, Laney is a risk taker, restless and dissatisfied, eager for the rough and tumble contests that help affirm his masculinity, who craves freedom and for whom the ultimate accomplishment and happiness is the symbolic independence of the loner. Laney Chouest is the quintessential masculine entrepreneur, and EC is Laney Chouest.¹¹

Trus Joist MacMillan¹²

At Trus Joist MacMillan (TJM), product innovation is noteworthy because it is a response not so much to a chronic or acute crisis but to a nagging problem. Instead of assigning product innovation to a small number of highly specialized employees in an R & D department, TJM's parent organization has deliberately created a workplace environment based on the proposition that anyone can be an innovator. Put differently, the parent company has innovated a culture of innovation. This type of entrepreneurship is much more consistent with Drucker's ideas than Schumpeter's. Indeed,

¹¹ EC won the U.S. Senate Innovation Award for 1990, and it is customary for one of the senior managers of the winning firm to serve afterwards on the selection board. Accordingly, Laney Chouest was appointed to the selection board and since then has made several site visits with the author to other firms in Louisiana. The author's comments about Chouest are based importantly on learning more about him through those visits.

¹² From a site visit to the company's factory in Natchitoches LA in 1992.

Drucker rejects the very "Knights of the Round Table" image of the entrepreneur which Schumpeter embraces (1985, p. 139).

In 1985 TJM opened a plant in Natchitoches, Louisiana to produce laminated veneer lumber from the nearby supply of southern yellow pine. Today the plant manufactures MICRO=LAM laminated veneer lumber which is the world's first laminated veneer lumber. The product is made from sheets of veneer peeled from a log. These sheets, which TJM buys from lumber mills located in Louisiana and Texas, are dried to reduce moisture content, ultrasonically graded for strength, and then permanently bonded together in a continuous press using adhesive, heat, and pressure. MICRO=LAM laminated veneer lumber is available in lengths to 80 feet.

Forest shrinkage means that today it simply is not possible to supply the demand for lumber of lengths to 80 feet from saw timber. For that reason, TJM calls its work "reinventing the forest." Strength much more so than aesthetics is the central characteristic of the MICRO=LAM product. TJM claims that MICRO=LAM laminated veneer lumber currently is the most versatile and widely accepted of the various structural composite lumbers. The manufacturing process at the TJM plant in Natchitoches removes and disperses the natural defects inherent in wood by randomly and automatically loading the veneer sheets into the press from three stacks, each of which contains sheets of various thickness and various defects. The resulting product is strong, dimensionally stable, and very reliable. MICRO=LAM lumber, which is produced in five standard widths and in various thicknesses, is used in several applications on the job site including multi-ply load-bearing headers and beams principally in the residential construction market and flanges for the company's wood I-joists.

MICRO=LAM laminated veneer lumber is the result of a project initiated by TJM in 1990 to address the problem of cupping -- the slight bowing characteristic of all wood, including wide laminated veneer lumber, when it is exposed to moisture. At that time, customers preferred douglas fir to southern yellow pine because with douglas fir cupping is less pronounced. Some contractors at that time were installing TJM laminated veneer lumber by chiseling the ends to make them fit into metal hangers thereby reducing the strength of the lumber.

The project used brainstorming sessions to suggest methods that might lead to a solution to the problem. A trial then was set up to evaluate the suggestion, which consisted of introducing moisture by means of a wet towel into the lumber modified in accordance with the suggestion and later measuring the amount of cupping. Working with an out-of-state company, the project team after several attempts finally discovered and settled on an overlay which is applied to the top and bottom veneer sheets and is bonded to the laminated veneer lumber by the same heat and pressure used to manufacture the compressed lumber. The overlay provides a waterproof barrier to prevent moisture uptake at the same time it adds to the dimensional stability of the product. TJM's new product went into full production in September 1991. TJM is convinced that since none of its competitors is able to deliver laminated veneer lumber produced from southern yellow pine that does not cup the additional cost to the customer (about three percent) does not put TJM at a competitive disadvantage.

TJM is innovative in another way which is quite unique, at least among the more than 40 companies visited over a ten year period. TJM has innovated a process to nurture, encourage,

recognize, and reward innovation. In 1985 TJM's parent organization established the Innovator's Hall of Fame to recognize and honor employees who have made a significant contribution to the company's success through innovation. To qualify for this award, an employee first must be nominated by a peer or supervisor. When the innovation is approved by the plant manager, it is sent to corporate headquarters. Two winners are inducted every month. They receive a plaque commemorating their innovation, their name on a large plaque at corporate headquarters, ten shares of stock of the parent organization or \$300.00 worth of stock, whichever is greater, an Innovator's Hall of Fame jacket, and are highlighted in the corporation's newsletter.

Further, the annual report of the parent organization contains not just the customary financial information and stockholder's letter but a large, slick, full-color section on company innovators as well. The innovators and their innovations are pictorially represented in eye-catching and whimsical fashion. Included among the innovators cited in the 1991 annual report are three employees at the TJM plant in Natchitoches for their development of the MICRO=LAM product.

TJM embodies masculine-type entrepreneurship in the sense that it is competitively driven by the marketplace to produce better products for its customers. At the same time, it exemplifies feminine-type entrepreneurship in that it deliberately nurtures its workers so that they think of themselves as entrepreneurs and rewards them accordingly.

Marine Shale Processors¹³

Controversy has plagued Marine Shale Processors (MSP) from the very beginning. The company claims to have innovated a multi-patented vitrification process which renders hazardous materials into environmentally safe aggregates for use as fill at construction sites, roadbed aggregate, and material to be manufactured into bricks. MSP claims that it is a recycler that manufactures a product. Its claim, however, is still the subject of litigation with EPA which charges that MSP is an incinerator generating a hazardous or potentially hazardous waste.

Since August 1991, MSP has been restrained by a federal district court order and is not allowed to sell its aggregate product. Instead the company is allowed to spread the aggregate over an adjacent site which MSP owns and plans to develop into an industrial park. A suit to be heard in 1994 will settle the issue as to whether the company is a recycler or an incinerator.

MSP is included herein because, given the size of the hazardous waste problem in the U.S. and elsewhere and, under the assumption that what MSP is producing and how they are producing it later are determined to be safe, MSP could be on the leading-edge of an innovation of great financial and social significance.

¹³ From a site visit to the company's plant in Amelia LA in 1994.

The primary elements of the MSP processing system are a 275-foot, counter-current rotary kiln where incineration occurs, a puddling furnace where vitrification¹⁴ occurs, and an off-gas treatment system where off-gases are treated. MSP explicitly excludes processing materials containing mercury, biomedical waste, and radioactive waste. Waste materials are "blended" before they are introduced into the kiln in order to produce a mixture with a high BTU content. Thus, the waste itself supplies most of the fuel that is used in the kiln. Temperatures in the kiln exceed 2000 degrees F, and the waste is burned for approximately a two-hour period. At these temperatures, the waste material deforms at the molecular level, producing an amorphous state in that material. This molten slag then is tapped and upon cooling hardens into a glass or glass-like product that supposedly passes EPA leachability standards. Gases from the incineration are emitted through a stack which at MSP is continuously monitored by a patented real-time mass spectrometer system for eight specific generated gases. The plant is automatically shut down if the sensors indicate that a gas exceeds a predetermined threshold concentration. In addition, the stack has the required scrubbers, and MSP officials were unyielding in their insistence that all contaminants, whether solid, gas, or liquid, are fully contained in the facility.

A toxicologist is required to determine if the gases emitted are below the EPA thresholds and in fact are not harmful, especially to humans in the immediate area. A molecular chemist is required to determine if the aggregate indeed is inert and safe to handle and use. If the MSP process is cleared in court, one major advantage to hazardous waste generators is that their liability would end with the vitrified material rather than continue as it does at present with simple incineration processes that reduce the waste to ash which then is buried. For MSP, approval translates into a huge financial reward, even if the company provided the aggregate to customers free of charge, because of the high initial cost and liability of burying the ash from incinerated waste in landfills.

The senior officials of MSP were the most intense persons this author has met in making site visits in Louisiana since 1984. In particular, they were convinced that the EPA charges against the company had been stirred up their competition, that is by companies operating incinerators and dumping the ash in landfills. Given the competitive energies clearly visible at MSP along with its marketplace focus, the company exemplifies masculine-type entrepreneurship.

FINAL REMARKS

It is a mistake to represent the entrepreneur strictly in terms of rugged individualism. The entrepreneur is a whole person, one part individual being and one part social being, one part masculine and one part feminine. The entrepreneur's individuality is reflected in his/her creativity and is expressed competitively. His/her sociality is reflected in a sense of belonging and is expressed cooperatively. Thus, just as the four economic processes and their associated economic functions are activated by the two organizing principles of competition and cooperation, entrepreneurship in certain instances is competitive and in others it is cooperative.

¹⁴ Vitrification is a process of converting materials into a glass or glass-like substance [cf. EPA].

Following Ong, this author has speculated that the male's biological and psychological need to prove to himself that he is not female, to prove his individuality, is worked out in part through the rough and tumble competition of the world of commerce. Thus, entrepreneurship pursued competitively in the marketplace tends to be a masculine thing. The female needs no such differentiation and therefore is more disposed to incorporate, to harbor, to keep. Thus, entrepreneurship pursued cooperatively in the workplace tends to be a feminine phenomenon. Further, it is speculated that the entrepreneur who is successful in both the workplace and the marketplace is a person with an equivalence of both masculine and feminine qualities.

Another postulate presented in these pages is that the entrepreneur is not as rare as Schumpeter suggests (1983, p. 81) because entrepreneurship is one means by which humans work out their masculinity and femininity. A related postulate is that entrepreneurship cannot be bureaucratized, as Schumpeter suggested, because it is fueled by human sexuality. This author's visits to over 40 private companies in Louisiana since 1984 provided solid anecdotal evidence reinforcing both postulates.

Most speculative of all is the argument to the effect that the black-on-black street crime which today plagues young black males in particular in the U.S. stems in part from a failure to channel the violent urges of these young men into entrepreneurial activity.

Four general and brief remarks about entrepreneurship and the entrepreneur derive more directly from the site visits. First, there is no entrepreneurship without the entrepreneur acting either competitively and, therefore, as the Many or cooperatively and, therefore, as the One. The successful combination of the two -- competition and cooperation, the Many and the One -- in one company is a truly awesome thing to observe. Second, and following from the first, innovations are as numerous, varied, and fascinating as the humans who champion them.

Third, entrepreneurs are powerfully driven to act by such powerful forces as financial ruin and the seemingly impossible complexities of the task at hand in a way that is reminiscent of Newton's third law of motion: for every action there is an equal and opposite reaction. Fourth, entrepreneurship rarely takes the form of just one of the five main types of innovation enumerated previously. More often it comes in combination. In manufacturing, to illustrate, a new product typically requires new tooling, new or different materials. Introducing an established product in a new market likely leads to some change in the way the enterprise is organized.

Consistent with a personalist philosophy that underpins what has been said to this point, for better or for worse these forces are likely to leave two distinct imprints: one on the innovation itself and the other on the innovator. The overall importance of entrepreneurship in economic affairs and in human terms suggests that the imprints left on the innovator from entrepreneurial activity are far more significant than the imprints left from routine work. Entrepreneurship, therefore, is one means by which a human being becomes more fully a human person.

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