

Luddites: ALIVE and WELL

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"Works themselves are of greater value as pledges of truth than as contributing to the comforts of life."

Francis Bacon

"The business of the future is dangerous."

A. N. Whitehead

"And workers today who protect themselves against emotionally and intellectually stultifying effects of factory life may be seen as the Luddites natural heirs."

Christopher Hibbert

Abstract

If management in industry today is to successfully administer an ever-expanding productivity, it must understand the message of the Luddite in the workplace.

These sixth-generation heirs of the original followers of Ned Luddlam are best perceived in light of their early nineteenth century English origins, and their expressions of protests and disenchantment with technology and intolerable work conditions during the entire Industrial Revolution.

The Luddites are alive and well today. Their message of technophobia, their insistence on "know-how" being combined with "know-whether", and their determination to experience "job enrichment", are as vital now as they were in 1811.

The very best opportunity to appreciate and accommodate the Luddites in the workplace is the interdisciplinary team of occupational health physicians and nurses, the industrial hygienist, and the safety engineer.

Introduction

As the American colonies began their quest for independence, so began in Great Britain and on the continent of Europe a militant campaign by organized trade unions to effect rapid changes to intolerable working conditions. One such popular disturbance in 1811 assumed the name "Luddite", after Ned Luddlam, described as "an ignorant youth, in Leicestershire who, when ordered by his father, a frame work-knitter, to square his needles, took a hammer and beat them into a heap."¹

Another story, slightly different, relates that in the same village referred to above, there was a "simpleton living in obscurity" who was the natural butt of heartless jokes. "One day, provoked beyond endurance by his tormentors, he chased one of the children into a nearby factory. He lost track of the child there but he did find two knitting frames and vented his anger on them instead." Thereafter in that district poor Ned Ludd (not "Luddlam") was automatically blamed whenever frames were smashed.²

When frame-breaking in Knottingham began, the name "Ludd" was adopted by the incensed workers. It was not unusual for various leaders of the workers' revolt in addressing anonymously their threatening letters to offi-

cials, to sign them "Ned Ludd" - or, on occasion, for added effect, "Captain Ludd" - or even "General Ludd"!

Disorders in which attacks upon machinery were the major acts of the rioters were very destructive. The results were the loss of hundreds of thousands of pounds worth of machinery and other property. The Luddites placed a million people or more (merchants, manufacturers, and laborers) temporarily at their mercy. They were stopped several years later only by the use of military and civil force. The army had become the police force of Industrial England in 1811 and 1812!

But the Luddites were not the first to violently object to the machine age. In the 1700s, Dutch workers had similar reactions to the harsh and dehumanizing character of their work and workplace brought about in part by mechanization. They would on occasion take their wooden shoes (sabots) and throw them into the gears and wheels of gig and shear. With help from the French (linguistically) comes the word "sabotage" for such purposeful and calculated destruction.

Modern society is no stranger to sabotage in the workplace, nor is it immune to future acts of labor protests and destruction. Whether this happens or not will depend in significant part on the professional appraisers of the workplace: the industrial hygienist, the occupational physician and nurse, and the safety engineer.

The Luddites must be reckoned with, but only after their history and message are clear and we understand the forces at work on workers today. By applying this message, it is possible to minimize the negative aspects on workers of mass production.

The scope of the definition of Occupational Health is expanding. Certainly the professional roles of the industrial hygienist, the safety engineer, the physicians and nurses are becoming increasingly interrelated as well as broadening in scope. The physician needs to understand the technical nature of potential workplace hazards; and all must have increasing awareness of and respect for the various physical and emotional factors which influence the worker.

This is a sophisticated and complicated matter. The same motives which drove "Ned Ludd" and his band of coppers and shearers to acts of violence and destruction against machinery are still present in the workplace today, more subtle, perhaps, but most definitely presenting for management, as well as the multidisciplined health and safety team, a great challenge. An adequate picture of the industrial setting today with its appropriate focus on the worker him/herself can not be adequately appraised without factoring the influence of such Luddite impulses.

By looking briefly at the pros and cons of technological innovations as they are introduced into the workplace, this paper attempts to show that Luddism still exists

today. Once Luddism is considered, one can more fully appreciate the sometimes contradictory information coming to the population in general and the worker in particular as he/she is exposed to the persuasive arguments of "the echo-hysterics", the "technophobes", and those who are enthusiastic advocates of "know-how".

The Luddite of today's workplace asks that technical "know-how" be modified by "know-whether", that attention be given to the uses to which technological innovations are put and the directions that these forces lead mankind.

It is the suspicion of the author that as long as increasing attention is given to "know-whether", and that sufficient resources are invested in an appraisal of the various uses to which new technological innovations are put, mankind can be benefited and the sixth-generation decedents of "Ned Ludlam" can find considerable satisfaction in the fact that they have well represented the position of care and caution as the world continues to grow in technical capacity and even promise.

Part One

There was a trial at York on Saturday, January 2, 1813. It was one of the most dramatic and tragic trials in English legal history. Scores of men were brought up from cold, dark and damp cells to stand accused of an extraordinary variety of crimes in the cramped dock of the court. They were charged with murder and assault, with plundering and stealing arms, with malicious damage to property, with treason, incitement to riot, and the administration of illegal oaths.

The youngest criminal was a boy of fifteen, the oldest nearly seventy. Most of them were cloth workers, but there were also hatters and shoe makers among them, card markers and coal miners, tailors, butchers, apprentices, watermen, and carpet weavers.

Most of them were honest men with no criminal records. Many were illiterate. They had one thing in common: they would all be known to history as Luddites.

During the Winter of 1810-11, London was flooded with accounts of disturbing speeches, along with a stream of the most alarming reports about the widespread disaffection and riots they provoked. Most of the riots seemed to be spontaneous protests against the rising prices and increas-

ing scarcity of food occasioned by Napoleon's Continental blockade, or against the government's retaliatory orders. These orders, by severely limiting British exports to the Continent, had halted certain industries at home.

But there were other riots that appeared to have been planned. Members of the government read with horror of hundreds of working people meeting at night in fields ringed with sentries. Masked orators harangued the assembled workers. There was talk of weapons, of binding and terrible oaths, of strange unnerving initiation ceremonies, of imminent attacks on employers and other respectable citizens. The government found it extremely difficult to confirm these disturbing reports, for the Combination Acts of 1799 and 1800 had effectively driven trade unions underground. Working people were closing ranks and successfully excluding spies and informers from their illicit associations.

The workers avoided open confrontation with employers, but if their demands were not met, men would one by one give notice until an entire labor force had simply vanished. Sometimes they would resort to violence, damaging the goods they were paid to manufacture, breaking workshop windows, destroying tools. For the workers whose livelihood was threatened by new mechanical contrivances, these violent methods seemed to offer the best means of redress.

Clothworkers from Yorkshire, cotton weavers from Lancashire, and framework knitters from the counties of

Nottinghamshire, Leicestershire, and Derbyshire were all skilled tradesmen who took pride in their work and jealously guarded the traditional privileges to which their expertise entitled them. This seemed especially true of the Yorkshire clothworkers, also known as croppers or shearmen, who considered themselves superior to other workers in the district. Often they earned as much as three times the average wage of other workers in similar trade. Now, however, their pride was being undermined by the growing interests in two cloth-dressing machines: the gig mill, used to raise the nap on woolens, and the shearing frame, a new invention that trimmed away the superfluous nap. The gig mill was not a modern invention. It had been known for centuries, but in Yorkshire - with the exception of a few villages outside the main centers of trade - the clothworkers had so far successfully resisted its introduction; in Leeds not a single employer had dared set up one in his factory.

Fear was widespread that such machines would destroy the workers' traditional way of life and their own high standards of craftsmanship. Some of them also feared - as later generations would, in fact, find - that machines might well render the workers' day stupefyingly boring. Nonviolent methods were suggested and attempted. Suggestions were made by the workers' representatives for a tax on machine-worked cloth, the proceeds to be paid to unemployed croppers until new work was found. Some employers

agreed, especially when the workers, prevented by law from forming a trade union, instituted "Sick Clubs" or "Institutions" as a quasi-legal alternative. Several smaller employers contributed generously to the funds.

However, the larger employers and the authorities in London were less sympathetic. Political influence on the part of the larger manufacturers was significant. When the "Institutions" delegates were sent to London to present the clothworkers' cases against both the unrestricted introduction of the gig mill and the employment of unskilled men and boys, they were treated scarcely better than criminals by the Parliamentary Committee on the Woolen Trade. Parliament, however, duly distressed, passed several laws which robbed the cloth workers of their job security and unemployment compensation. He had little recourse now but to face the gig mill and the shearing frame with implacable enmity; when various Yorkshire employers took advantage of their workers' weakened position to install the machinery, violence could no longer be delayed.

All over Southern England in the early months of 1811 other workers were edging toward violence in much the same way. Their main grievance had more to do with their employer's attempts to save money by cutting down on labor and the quality of goods. They were also deeply offended by shoddy articles and rebelled also against higher rents for the homes in which they lived as well as the rent paid for the looms they had rented from the manufacturers.

Again, like the clothworkers from Yorkshire, their efforts at redress by appealing to Parliament were notably unsuccessful. And like the Yorkshire croppers and the stockings of the Midlands, they felt forced to violence.

By the end of 1811, the character of these early outbreaks became very alarming to the manufacturers. It was felt by the public at large that the riots were carefully planned and deliberate. A provincial newspaper reported that the rioters appear suddenly, in armed parties, and under regular commanders. The chief commander was styled "General Ludd".

The signature, "General Ludd," appeared at the bottom of inflammatory handbills and at the end of dire warnings to employers whose machinery had been marked for destruction. It appeared in ballots and broadsheets. Children of the poor were taught to venerate the name and to remember it in their prayers. It was mentioned with fear and apprehension at the dinner tables of the rich. Men said that to disobey an order given on its authority was to risk immediate death.

In early 1812, the Luddite campaign in the south of England was slowing. Most employers had been forced to increase their men's wages, dismiss unapprentice boys and women, and improve the quality of goods. The attacks also slowed because a large number of troops had moved into the area. Also, the government passed a bill that made frame breaking a capital offense!

In Yorkshire, however, Luddism was on the upswing. Workers there were urged in the name of "General Ludd" to join the ranks of those who wished to see working conditions vastly improved. Employers received letters threatening murder unless their detestable shearing machines were pulled down.

Luddites of Yorkshire operated with military discipline, often marching toward their objective in silent ranks. Sometimes, however, they would sing. Music was of an arousing martial type. Verses were included such as:

And night by night when all is still
And the moon is hid behind the hill,
We forward march to do our will
With hatchet, pike and gun!
Oh, the cropper lads for me,
Who with lusty stroke the shear frames broke
The cropper lads for me!

As within other areas of England experiencing similar militancy, the smaller manufacturers came to an accommodation with the Luddites by removing many of the machines, firing women and children, and working to improve the quality of their products. However, the larger mills hired guards and refused to cooperate. Two large mills were targeted for violence. William Horsfall's mill near Huddersfield and William Cartwright's at Rawfolds in Liversedge were targeted for attack.

Cartwright's mill, despite armed workers and soldiers manning a line of defense of spiked rollers to protect the machinery, were attacked by two hundred Luddites armed with

pistols, hammers, hatchets and muskets. Shots were fired and casualties were experienced on both sides. Two Luddites who fell at the mill door were Samuel Hartley, a twenty-four-year-old-cropper who had been dismissed by Cartwright when the new machinery was installed, and John Booth, nineteen years old, a harness maker's apprentice and the son of a former cropper who was a clergyman in the neighborhood. The two wounded men were finally taken to a nearby inn and attended by doctors. Hartley died almost immediately. Christopher Hibbert, writing in *Horizon's*, reports that the Reverend Hammond Robertson, a pugnacious High Tory who had been at Rawfolds the night that Cartwright's mill was attacked, hovered over the young Booth hoping that he might confess the names of his accomplices. He refused to speak, however, until he knew he was dying, and then he motioned to the Reverend Robertson to come closer. "Can you keep a secret?", he whispered. With eager expectation Robertson replied that he could. "So can I", gasped Booth, closed his eyes and died."³ Cartwright became a relentless pursuer of the Luddites who had survived the attack on his mill. He became something of a folk hero and certainly ingratiated himself with the authorities, the army officers, and Tory squires, magistrates, and parsons alike. Of course, the clothworkers hated him more than ever.

The owner of the second large mill, William Horsfall, had been targeted for Luddite attack, and his mill, like Cartwright's, was defended by armed workers and soldiers.

It was as though he invited the Luddite attack hoping perhaps to emulate the success that Cartwright had enjoyed in protecting his establishment.

Horsfall, however, was ambushed and killed along a country road by a group of Luddites including their leader, George Mellor. The murder tended to unite the middle and upper classes. Finally, despite widespread oaths of silence, an accomplice of Mallor's turned king's evidence. Nine months after the murder, Mallor and his accomplices were finally captured. Along with a number of other Luddites and their supporters they were carted off to York and the mass trials of January, 1813 began.

With additional violence and assassinations, the Luddite movement appeared prepared to evoke a general insurrection. As one condemned Luddite now put it, "Ludding and Politicks were closely connected".

Only inadequate organization and poor communication prevented a general open insurrection. Luddism erupted at a time when the unprotected workers were suffering from unscrupulous manufacturers and unjust employers. No longer was there an image of a benevolent corporate state -- were artisans occupied a lowly but nevertheless respected position in society. Artisans and journeymen felt themselves thrust beyond the pale of the constitution and robbed of those few rights they had previously enjoyed.

They and tens of thousands of skilled workers in other trades were to be given over to what they considered little

better than slavery. They were to toil in vast, forbidding factories where their identities would be lost, where they and their children would be exploited, oppressed and corrupted, confined for all their working lives in demeaning incessant sole-destroying labor. From this point of view, then, Luddism can be seen as "a violent eruption of feeling against unfair labor practices, poor wages, and a real fear of losing their jobs. It can be said that workers today who protest against the emotionally and intellectually stultifying effects of factory life may be seen as the Luddites' natural heirs."⁴

Hostility to labor-saving machinery was no new feature of English life. Attacks upon such machinery were a well established feature of the industrial scene well before the time of the Luddites. The common denominators for unrest and even physical violence seems to have been dependent on whether or not the worker's perceived that their jobs were being threatened by machinery or that their wages were being lowered or that the quality of work was being seriously impaired.

It can be said that all the workmen involved in Luddism had specific grievances. Their particular grievances were most consciously felt in the intensely depressed situation of 1811-12 when a commercial crisis and bad harvest combined to produce famine prices and wages at starvation level. The real purpose of the Luddites was to use machine-breaking as a dramatic and effective means to

convince employers that they would no longer tolerate such unacceptable conditions in the workplace. They might have resorted instead to arson or murder or kidnapping, but chose machine-breaking because it perpetuated their skilled individual labors and preserved otherwise the work environment for their continued employment under these demanded conditions.

It is enough for the scope of this paper to note that the acts of the Luddites are interesting for a number of reasons, apart altogether from the unusual damage they caused and in the unprecedented measures into which they forced the authorities. They were an early and striking example of direct action as an instrument of labor policy. They were a definite and initially and temporarily a successful attempt to apply pressure to certain employers and to force them to grant the body of the employees various concessions which they were demanding and which they had been unable to obtain by pacific means. "Had they been successful they might have made a policy of sabotage a more popular substitute for trade unions or political action as a means of obtaining a redress of grievances for manual labor than in fact it was to be."⁵

Disorders today, like disorders in England a hundred years ago, are often like the bubbling of boiling water, a sign of changes which are taking place within a body whether it be of people or of matter. Riots and other forms of organized labor violence are signs that something radical is

wrong with the society in which it happens. It is not unlike the symptoms of disease, a warning to the patient to alter his habits of life. Terrorism in the 20th Century is an example of direct action attempting to affect the policies of government.

It is unfortunate that nations should require overt acts, such as disorder, as individuals require physical suffering, such as disease, before they recognize and take in hand the readjustments that are needed in their way of life. It is because of that, however, that disorders such as those dealt with are worthy of particular study.

Part 2

General opposition to "progress" is often seen as involving a personification of technology as an evil spirit. "Luddism" therefore, in the minds of such people as Dan Lyons, professor of Psychology at Colorado State University, expresses one point of view when he argues that Luddites believe that technical powers, misused, will cause more harm than good. "Therefore, these powers should count as bad."⁶ And Luddites in the twentieth century can be seen protesting the construction of a nuclear generating facility, protesting against the dumping of industrial waste into rivers and lakes, greatly concerned about the asbestos "problem" and the effects of storing toxic chemicals using methods which will eventually cause their release into ground water.

The Luddite today, if adequately recognized, would say that technical powers potentially can cause more harm than good and that, therefore, these powers should count as bad. The Twentieth Century Luddite further argues that technology used for half-blind changes can damage world ecosystems, even swamping their adjustment-mechanisms. They aver that superhuman powers go sour with merely human wisdom. Know-how tends inherently to pull ahead of 'know-

whether'.

One of the greatest errors that could be made by industry today would be to dismiss the Luddites' voices late in the 20th Century as confused, overly conservative and cautious, or as simply "liberal". Many science writers seem to feel that general opposition to technical progress (Luddism) is simply confused, deserving patient explanation or humor more than refutation. Science writers seem to see a conceptual error in Luddism: even if bad things have happened which should not have happened in a pretechnical society, it's foolish to blame these troubles on technology.

Dr. Edward Teller, called "father of the atomic bomb", when told of the worry that some Americans have in believing that technology is bad, is reported as to have said, "There is no invention, no new development that is either peaceful or warlike. Anything can be used in a variety of ways." And Petr Beckmann compares technology-critics to those who would blame widespread obesity on farmers, and more vividly, to those who would blame the Crucifixion on the existence of hammers and nails!". There appears, however, to be a kind of Luddism that in its general dislike of technical progress does not seem muddled and merits serious attention. One may claim that if this Luddite "theory" is to be opposed, it deserves serious refutation. Scorn and characatures of Luddism are hardly a satisfactory response.

One expression of "technophobia" that seems to merit special attention is the repeated statement of concern with "progress" when it appears to be fragmented and without any discernable overall plan and direction.

There are those who worry about the misallocation of our resources and the discovery of finite limits to the growth of our material development. There are those who worry about the alienation or the outright doom of the post-industrial, technological, or automated man. It should be noted that there are those, the young, "who have left the complications of their artificial surroundings to grow vegetables, raise sheep, build houses out of wood with their own hands, and otherwise make a living in blue jeans in a piney glade."

As a result of such "quiet rebellion", a good deal of attention is now being given to the shape of things to come. Looking ahead is now something of an infant industry. Some are responding pessimistically and feel that the future will just not work. Others, a good many others, have let their imaginations go on particular possibilities when some of the machines and procedures now in the development stage reach perfection. Their findings are as precisely stated and hairraising as anything in the book of Revelations: man as the drone in a hive designed by a computer; man as an assembly of spare parts - kidneys, pineal glands, brains; man cloned into existence as some new product of rational selection.

Some are more philosophical. But they seem to dwell mostly in cautious generality. Some hypothesize that there is currently such a steady depletion of essential resources that very soon could make it impossible to meet the needs of a growing population. There are, in other words, such definite limits to our growth that we must plan a different kind of world for ourselves.

An what of the present? Who are the Luddites? Where are they? What is their message? Is it relevant? Are they confused? Need we listen?

The Luddites are in the work place today. And there is a body of literature being written into our existing library of knowledge which results in a systematic justification of a general dislike of technical progress. It is a "technophobia" that is as strong as it is controversial.

It becomes increasingly apparent that what the Luddites of today are saying is that the power which they percieve as having possessed earlier is now threatened or has in fact been taken from them. And they are ashamed of being weak and powerless despite the fact that Luddites have always been weak and powerless.

It is not so much the possession of power as it is the use of that power. (Some people would say that power and skill count as "good" in every context.) What can be said is that without "know-whether", "know-how" is incompetence.

In a recent popular motion picture the male star, while attempting to rescue a precious stone from its

captors, encounters a number of black robed warriors who are obviously expert in the art of swordsmanship and the other disciplines of the "ninja" fighter. He quickly dispatches all but the obvious leader of the group who is presumed to be unsurpassed in his many skills. He approaches our hero who, only after a moment of hesitation, removes a large caliber revolver from his holster and dispatches the expert in martial arts at a distance of some 15-20 feet!

In such a case we can say "know-how" (i.e., the martial arts expert's command of his many weapons and disciplines) was incompetent in facing the gun of our hero. And, therefore, without "know-whether", the result became one of failing to meet his goal. We can admire the ninja warrior for his athletic ability, his courage, and his fighting skill, and can assume that he would have been a remarkable individual had his gifts been matched by good sense. We might agree that he was strong and resourceful, but we would hardly call him powerful in any sense that implied our cool reflective admiration.

It is only logical and perfectly meaningful to say that the over confidence on the part of the ninja warrior caused his demise by leading him into a confrontation which he could not win. It is also coherent to add that such skill was bad for this man (as pollen is bad for allergic people, though no moral fault of the pollen).

Dan Lyons, in Are Luddites Confused?, speaks of "powers as multipliers: they increase the value of wisdom, but they also multiply the disvalue of folly". He adds, "but what counts is not how the power might be used but how it is likely to be used".⁸ History seems to document quite clearly that weapons of increasing potential for destruction in the hands of great powers guided only by average discretion, are more apt to add disvalue to the lot of the peoples of the world.

In a recent landmark court decision it was determined that the publishers of "Soldier of Fortune" magazine were liable -- and therefore responsible -- for allowing to be printed in their publication an ad from an ex-Vietnam soldier, expert in firearms and explosives, hiring himself through that same ad for whatever purpose the reader might desire. In other words, the court has decided that one must be keenly aware of foreseeable and unforeseeable misuses since, at least in this case, the court decided that the publisher was morally and legally guilty since he could have but did not foresee the misuse that would likely occur.

It can be argued that the Wright brothers, despite admiration for their cleverness and perseverance, are perhaps not so deserving of our admiration as the airplane has produced far more suffering, terror and hatred for mankind than benefits.

In a very real sense powers are valueless until they are used well or used ill. And it should be noted also that there are many more ways to misuse technology than to use it correctly and for mankind's well being.

It appears that the "unforeseen effects" of technology often times have negative elements which predominate and this should be a cause for some pause -----.

It has been assumed that Luddites have a falsely rosy picture of the past. It is perhaps more accurate to suggest that the Luddites could see clearly that the world was awful back then in the "good old days" - noting, however, that it is pretty awful now also! The question, in this context, must be asked whether or not there has been overall advances or regression with the advent of such awesome technology.

The question has been asked in this regard as to whether or not there are more people in the world today living without electricity than before the invention of electrical devices. Obviously the population has increased, but is this possibility an example of great technological prowess without the necessary moral conviction to see that these "blessings to mankind" are shared with an increasingly larger proportion of the world's people. Human misery may have well increased since the scientific revolution, though not as fast as prosperity. Would we think a family is better off because while formally two children were miserable now three out of ten chil-

dren are miserable?

It is difficult to perceive accurately the level of suffering when one views the world as a whole. Certainly life in the middle class western world is better. How does one measure misery against prosperity - especially if these indices are used carefully and sensitivity for all the peoples of the world?

What is the argument for those who would deride the "prophets of doom?" One of the greatest arguments put forth by the devotees of doom and gloom is expressed by Dr. Paul R. Ehrlich, who startled a good many people with the publication in 1968 of his book, "The Population Bomb." "The battle to feed all humanity is over. In the 1970's the world will undergo famines, and hundreds of millions of people are going to starve to death in spite of any crash program embarked on now."

Much stress is made by Dr. Ehrlich on the "population explosion" and the "inconveniences" which are likely to result there from. It is evident that this particular argument used with considerable effect in the past has prompted researchers to double their efforts and avert such a calamity. In a recent United Press International release dated March 12, 1988 it was reported that the world experts in population, including the epidemiologists who follow carefully the latest trends, can now predict with some certainty that by the year 1993 the world will experience zero population growth!

If this is reliable and is in fact experienced in the next five years or so, it will be a strong argument for those who continue to insist that technology when applied to such a phenomenon can have extremely positive and beneficial effects, in marked contrast to the chaos that would occur if modern technology, including those of birth control, were shunned because they were considered basically evil. Perhaps in truth the experts who predicted such gloomy results did, in fact, use over-simplified methods of prediction.

Professor Eugene Rebinovitch, one of the founders of the Federation of Atomic Scientists, expressed at the end of the Second World War, "Mankind has been given the power to use the immense energies locked up in the atomic nucleus for whatever purpose it may see fit - destroying itself in an atomic war or building a more prosperous and secure world." The potential ambivalence of nuclear energy was the theme that dominated most discussions of the social and economic value of nuclear energy.

Another proponent for continued or even expanded use of technology is Dr. Petr Beckmann. Writing in Echo-hysterics and the Technophobes, he exhorts that "more, not less science and technology is needed to eliminate pollution and to clean up the environment;" and that "curbing science and technology is the cure that results in easing the blood pressure when the patient is beheaded!" He further stresses that, "The current sentiment against

technology is being fanned by a motley crew of doomsday prophets who are adept in using scientific jargon, but inept in using scientific methods".⁹

Beckmann agrees fully with John Mattox's appraisal of the "population explosion," stating most emphatically that "there is no population explosion in the United States anywhere in sight; fertility rates have dropped below all previous record lows, and demographers conclude from the U.S. Census Bureau statistics that the population will stabilize within the generation of present teenagers.

There is little danger from a population explosion in the developing countries, for their population, hitherto kept in check by famine and disease, will stabilize as these countries became industrialized, repeating the same patterns as observed in the developed countries some time ago.

In a sentiment that seems to be anti-Luddite, Dr. Beckmann asserts that the doomsday balloons have been popped one by one with dispassionate precision. He gives credit to the "ecocult" movement as starting with good intentions. "The original idea of clean air, clean water, conservation of nature and improved quality of life, still figures in the occult literature," he adds, and then injects, "just as human rights still figure in this Soviet constitution".¹⁰ He feels most assuredly, however, that this idea has been heavily overshadowed by the principle of technophobia and stopping scientific advance under penalty

of doomsday. The blind opposition to nuclear power stations, to hydroelectric plants and the many other cures of easing the blood pressure by beheading the patient bear this out every time there is a choice between technological advance or stunting the growth of technology.

Luddites are not recognized easily in the workplace. A few persons who have recognized them are the individuals teaching computer courses in various parts of the United States. One cannot discuss adequately high-tech phobia without considering personal computers and the perceptions of instructors of employees who will soon be required to use personal computers in their work.

The scene is a typical classroom and the instructor who stands toward the back is watching the students for "Introduction to the Personal Computer" enter the room.

Anxiety and tension are visible on several faces, and the instructor watches one student find a seat, sit down and push his chair away from the computer in front of him. Another enrollee crosses his arms, a typical defensive posture, while an anxious woman, nervously nibbling her nails, turns her chair away from the desk with the look of confusion and anxiety.

The instructor realizes that many of these beginning PC users didn't come to the class of their own free will -- their manager signed them up! Most of them are afraid of PC's not only because they threaten their job security but because they represent change, which brings about stress

and uneasiness even in positive situations. They are worried that if they can't or don't learn how to use the intimidating machine in front of them, they may lose their jobs. What these and hundreds of other users are experiencing is coming to be referred to as "PC phobia", or the fear of either technology in general or the PC specifically.

"It's really fear of the unknown", said David Orischak, Vice-President of Marketing for PC Concepts, a training and consulting firm in Wayne, Pennsylvania. "It's also fear of making mistakes or looking silly in front of your colleagues. In the past, the tools of the businessman have been the calculator and the phone, and the tool of the support people has been the typewriter. Now, both those types of people are caught up in the change of technology, and that can be a terrible thing for some of them to go through."¹¹ While no definitive studies have been undertaken to determine just how many people experience PC phobia, some PC trainers estimate that over half the people enrolled in introductory PC classes may experience PC phobia or other stress symptoms related to the personal computer.

Mr. Orischak explains that a good half of the people that come in have that sort of fear, particularly in our introductory courses. And people like Mr. Orischak agreed that PC phobia is something for corporate micromanagers and information center managers to be concerned about. And this is only one type of corporation and only one phe-

nomenal, technological addition to the work place today.

Not every one agrees that PC phobia even exists or that it is something corporate micromanagers need to be concerned about. "There is enough awareness and enough media attention among the executives in middle management that people don't come in here scared any more", said Joseph Sabrin, Executive Vice-President of PC Etc., a PC training and consulting firm based in New York. "The word is out there now -- PC's aren't a mystery any more."¹²

Is it something for micromanagers to be concerned about? "Not any more", said John Turner, an Associate Professor of Computer Applications and Information Systems at New York University School of Business. "But then there never really has been concern about it, even when there were just terminals out there". Richard Koffler thinks PC phobia is a real problem, its just that awareness of the problem has been slowly spreading. He states, "It's only now that managers within technical departments are starting to realize these sorts of problems." Mr. Koffler is president of Koffler Group, a Santa Monica, California consulting firm that specializes in technology and human factors. "Up until now, they automated everything that moved and were more concerned with replacing people with machines. Now, they're starting to take a look at the jobs that automation created. PCs are changing the workplace so dramatically", he continued, "that those kinds of changes are bound to cause stress. The adaptation involved with

those changes causes stress as well."¹³

The trainers who believe in PC phobia divide sufferers into several categories -- just as they offer several explanations for the existence of such fear and several ways to overcome it:

It is usually more likely that beginning users that have little background in data processing, will experience PC phobia. As Romia Bull, the director of Metropolitan Life's Education Center in New York, summed it up, "We don't have to sell the techie classes, the ones for people who have decided to make a career out of data processing," she said. "It's the beginning classes that we have to sell the idea for."¹⁴

Chances are high that those same beginning users who suffer from PC phobia are also women, according to Debra Brecher, author of The Woman's Computer Literacy Handbook. "We have trained over 4,000 women, and at least 15% of them will say out loud that they are phobic, meaning they experience extreme anxiety around the computer", said Mrs. Brecher who created the Women's Computer Learning Center, a San Francisco training facility for women which was established to diminish those kinds of fears.

"And I DO think there's reason for companies to be concerned, because I have people coming to our center from corporations where they already have in-house training, and that training hasn't done enough for them."

It is also probable that phobics are the employees that have little or no involvement in the planning or purchasing of the very equipment that scares them. "You might think that if we found companies with the new installations of computers, that's where our customers would be", said Mr. Orischak "But that's not true, because, for the most part, those people have been involved in the decision-making process. The highest levels of stress come from people being promoted into positions where suddenly 75% of their job involves working on the PC."

For all the debate surrounding PC phobia, there is one area where most trainers and analysts agree -- that it can be overcome! However, it may require some changes or rethinking on the micro manager's or information-center manager's part. The efforts of Met Life's Ms. Bull, and her four instructors on staff, to erradicate PC phobia centers around training. "We make a special effort to choose instructors who can relate to people without the data-processing background," Mrs. Bull explained. "We make a conscious effort to choose accessible and open kinds of people who aren't buried in technical jargon". For users at Met Life, the classes are small and personalized. "We try to give them individualized attention and make it more of a hands-on-type atmosphere", she continued. "The instructor spends time with them and talks them out of feeling threatened by the PC".¹⁵

And, according to Stuart Friedberg, a senior training consultant at Met Life and one of Ms. Bull's four instructors, much of this efforts is geared toward erasing the fears that underline PC phobia. "These people are afraid to indulge, afraid that if they do something, everything will blow up in their faces", he said. "They are afraid of their jobs, and afraid if they don't learn the technology, they'll lose their jobs".

"We have to try and break them away from this and build an image of what the PC can do for them", he continued. "You have to be understanding and sympathetic, you have to hold their hand, and you have to make them feel as if everyone has experienced what they are experiencing".¹⁶

Mr. Orischak agreed that breaking down the apprehension is one of the biggest and most important tasks behind reducing their fears. He asked, interestingly, "Do you remember when you were in grade school? And you had apprehensions about taking a specific course, either because you heard it was very hard or the teacher wasn't that good? You build up apprehensions. Well, the same thing happens with PC phobia and we have to break down those apprehensions".

To do this, Mr. Orischak believes, it is necessary to have individualized, hands-on training. He notes that three years ago, a lot of people said that computer-based training (CBT) was the wave of the future and places like PC Concepts are flourishing, because you can't teach anyone

anything on a machine that they are afraid of.

In addition, Mr. Koffler believes, micro managers must make an attempt to involve future users in the planning process of any new technology and try to prepare them for the impending changes. Micro managers should encourage group participation. Have the people express their fears, their wish list and how they think things should be done. This sort of input will make people feel closer to the end solution, and if they feel closer to that end solution, it will be easier for them to adapt.

Be prepared to see the work system change. As people adapt to technology, they'll find better ways to do things, which means job descriptions will change and people's responsibilities will increase and decrease. He concludes, "Micro managers need to set up programs that explain the hardware. They need to explain that it's a tool for them to use. If they present it in the right light, they can break down those apprehensions".¹⁷

Perhaps people are intimidated by personal computers and other high technology devices because in accommodating to them and their potency for efficiency and accelerating information processing, they surrender some personal power. And people feel ashamed of being weak and powerless; they admire powerful people who can carry out their plans without impediment or failure.

If powers were categorically good, they should add value to every compound into which they enter; they should

improve every situation where they are involved. But a complete fool is, in many situations, better off weak; strength often adds disvalue to his folly. Powers act like multipliers: they increase the value of wisdom, but they also multiply the disvalue of folly (when great powers are guided only by average discretion, they are more apt to add disvalue).

It becomes essential to recognize that what counts is not how power might be used, but how it is likely to be used. One must talk of foreseeable and unforeseeable misuses. Speed is a defect in a blind horse!

If modern technology is likely to do more harm than good, it is not inappropriate to say it is bad for us, to regret mankind's acquiring these new abilities. We do well to interpret this feeling as hypothetical admiration: technologists would be splendid creatures if they had the superhuman wisdom to match their fantastic powers.

There seems to be underway in the world today a slow but growing realization that in users of staggering powers, only very small defects are needed (in knowledge, prudence, or benevolence) to produce catastrophe. Perhaps the Luddites in the work place today, perhaps in high-tech Silicon Valley or Research Triangle Park, are expressing in the microcosm of their own situation such personal fears as it reels backwards in the face of such potency. Therefore there is a certain plausibility to the Luddite worries

about whether or not we will have the requisite degree of virtuous wisdom.

Part Three

Luddism is alive and well in the Twentieth Century. It must be recognized, and if not dealt with in a sensible and humane way, it must at least be understood.

The Luddite today can note that effective world-government is not at all likely within the next 30 years. For this reason, the next wave of technical innovations will likely fall into the hands of national rulers tempted to behave like mad men even if they are sane! All in all, our cleverness keeps pulling further ahead of our wisdom. As with the earliest Luddites, our not-so-confused Luddites today hold that technical advances in the future are likely to produce more harm than good overall, so these discoveries will possibly be bad for us -- so he won't view them as real achievement and demanding admiration. He can't stop progress, but he doesn't have to like it.

A Luddite policy for our world today would give strong priority to research for monitoring change, and for understanding ecosystems; it would emphasize research for re-establishing changes (for instance birth control and solar energy) rather than for destabilizing change (such as fusion power, solar energy from satellites, or advances in death control from medical or agricultural breakthroughs).

In fact such a policy would be more "reactionary" than most of us could swallow: but it is not a confused or ridiculous policy, only a "far-out" policy. And of course not everyone advocating some of these research priorities is a Luddite!

In recent years concern over the effects of technological change has lead many Americans to ask whether the development and application of new technologies within the U.S. economy will create new employment or contribute to higher unemployment. Again, perhaps this is the generalization of a fear that many individual workers today sense creating the uncertainty which in turn leads to stress (and which again, in turn, can lead to disability and morbidity). Many Americans appear to be pessimistic about the answer to this question, an attitude that, if anything, is becoming more widespread. The relationship of technology to employment and the effects of technological change on the workplace and on U.S. productivity have become topics of national debate in the face of slow economic growth, high unemployment, and stagnation or decline in the real (inflation-adjusted) earnings of workers since 1970.

Technological and structural change pervade the U.S. economy as they do any dynamic economic system. "To ensure growth and economic opportunities for U.S. workers, technology should be viewed, not as the problem but rather as a key component of the solution."¹⁸ He adds further, "With the development of policies that support investment in the

human resources of this nation, as well as policies that deal with the consequences of technological change in an equitable and humane fashion, we believe that this latest in a series of transitions of new structures of work and employment can be accomplished efficiently and fairly. In the modern world economy, there is little choice -- the United States must remain at the leading edge of technology in order to preserve and improve the economic welfare of all Americans."¹⁹

Technological change is an essential component of a dynamic, expanding economy. Recent and prospective levels of technological change will not produce significant increases in total unemployment, although individuals will face painful and costly adjustments. The modern U.S. economy, in which international trade plays an increasingly important role, must generate and adopt advanced technologies rapidly in both the manufacturing and non-manufacturing sectors if growth in U.S. employment and wages are to be maintained. Rather than producing mass unemployment, technological change will make its maximum contribution to higher living standards, wages, and employment levels if appropriate private and public policies are adopted to support the adjustment to new technologies.

Technological change often involves difficult adjustments for firms and individuals. Workers must develop new skills and may be required to seek employment in different industries or locations. In many cases, workers suffer

from financial losses as a result of permanent lay-offs or plant closings. Managers also face serious challenges in evaluating and adopting new manufacturing and office technologies to an increasingly competitive global economy.

As a result of a National Academy of Science meeting reported by the National Academy Press, (Washington, D.C., 1987 and edited by Richard M. Cyert and David C. Mowery and entitled Technology and Employment), innovation and growth (in the U.S. economy) is observed by way of summary: "New technologies by themselves are not likely to change the level of job related skills required for the labor force as a whole."²⁰ Technological change is not projected to create a uniform upgrading or downgrading of job skill requirements in the U.S. economy. It is increasingly clear that certain sections of industry will be more affected by specific technological advances than will be industry in general. In these industries, such as microelectronics, there will be a special need for particular sensitivity to the Luddite sentiments in that it will not always be the worker who will have to be retrained, but that if workers today are to have "job enrichment" the work process may have to be changed to accommodate this centuries-old mind-set. This is especially important for managers and for the occupational health team as additional technologies such as robotics are introduced into the workplace.

Everywhere one turns in researching material on the subject of "technophobia", and the stress produced by the

introduction of new technologies into the workplace, publications emphasize the essential quality of secondary education as the minimal amount required for successful adjustment to the metamorphosis of the workplace.

The scope of the definition of "industrial hygiene" is expanding. Certainly the professional roles of the industrial hygienist, the safety engineer and the members of the occupational health team (physicians, nurses, et al) are becoming increasingly interrelated. There is little reason for the physician to avoid involving himself in the techniques of the industrial hygienist. He will better understand the abilities and limitation of the various and vital measurements. For the same reason the industrial hygienist should have increasing awareness of and respect for the various physical and emotional factors influencing the worker in the workplace today.

This is a sophisticated and complicated matter. It is apparent that the same motivations which drove "Ned Luddlam" and his band of croppers and shearers to acts of violence and destruction are in the workplace, more subtle, less militant and most definitely presenting a great challenge for management, as well as the multidisciplined health and safety team. An adequate picture of the industrial setting today with its appropriate focus on the worker him/herself cannot be adequately apprised without factoring the influence of such Luddite impulses.

By looking briefly at the pros and cons of technological innovations and their introduction into the workplace, as this paper has sought to do, brings the Luddite in the workplace today a bit more into focus. One can more fully appreciate the sometimes contradictory information coming to the population in general and the worker in particular as he/she is exposed to their persuasive arguments of the "echo-hysterics", the "technophobes" and those who are enthusiastic advocates of "know-how" ("technophiles").

And so the argument goes. For the purposes of this paper, it is important to realize that for the two major views presented, there are tens of thousands of Luddites among the American workers in industry today. They are unavoidably exposed to these arguments, and others still more extreme, and even more that approach "the middle of the road". The "Luddites" among the workers in industry are those who adhere to the argument that their lives in general, and their work specifically, is being threatened by innovation and "technological progress".

It is not the purpose of this paper to agree or disagree with "the Luddite view". It is enough to consider, as has been done in Part One, the history of Luddism, and in Part Two, the two major technologic mindsets at work on the Luddites today. It is increasingly apparent that management must address the issue of the "eco-cult", of which the Luddites are a significant part.

It is a suspicion of the author that as long as increasingly attention is given to the "know-whether" and that sufficient resources are invested in an appraisal of the various uses to which new technological innovations are put, mankind can be benefitted and the sixth-generation descendents of "Ned Ludlam" can find considerable satisfaction in the fact that they have well represented the position of care and caution as the world continues to grow in technical capacity and promise.

"--and so there wasn't much feeling of loneliness. That's the way it must have been a hundred or two hundred years ago. Hardly any people and hardly any loneliness."

Robert Pinsig
(Zen and the Art of Motorcycle Maintenance)

Endnotes

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²Ibid., p. 60.

³Ibid., p. 61.

⁴Ibid., p. 64.

⁵Ibid., p. 20.

⁶Lyons, Dan. Are Luddites Confused?, Colorado State University Press, 1986.

⁷Beckmann, Petr. Echohysterics and the Technophobia, The Golem Press, Boulder, Colorado, 1973, p. 5.

⁸Lyons, p. 384.

⁹Beckmann, p. 207.

¹⁰Ibid., p. 207.

¹¹Opischak, David. PC Phobia, Ziff-Davis Publishing Co., 1986.

¹²Ibid., p. 6.

¹³Ibid., p. 4.

¹⁴Ibid., p. 4.

¹⁵Ibid., p. 5.

¹⁶Ibid., p. 5.

¹⁷Ibid., p. 6.

¹⁸Cyert, Richard M. Technology and Employment,
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²⁰Ibid., p. 169.

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