

#1138

15 APRIL 93

GUILLERMIN

EDUCATION: EMERGING FROM THE DARK AGES

A. PIERRE GUILLERMIN

A SPEECH DELIVERED TO

SPHEX, APRIL 15, 1993

"DURING THE LAST TWENTY YEARS, WESTERN SOCIETY HAS PASSED THROUGH EXTRAORDINARILY TURBULENT TIMES. WE HAVE BEEN LIVING IN A TIME WHEN THE FUNDAMENTAL RULES OF THE WAY WE LIVE AND THE BASIC WAYS WE DO THINGS, HAVE BEEN ALTERED DRAMATICALLY. WHAT WAS RIGHT AND APPROPRIATE IN THE EARLY 1960'S IS NOW, IN MANY CASES, WRONG AND HIGHLY INAPPROPRIATE IN THE 1990'S. OR, CONVERSELY, WHAT WAS IMPOSSIBLE, OR CLEARLY OUT OF LINE IN THE EARLY 1960'S IS, IN MANY CASES TODAY, SO ORDINARY THAT WE FORGET THAT IT WASN'T THAT WAY."

SOME OF THE CHANGES IN TECHNOLOGY AND SOCIETY THAT WE HAVE EXPERIENCED INCLUDE:

- * DEREGULATION OF BANKING, THE AIRLINES, THE TELECOMMUNICATIONS AND TRUCKING INDUSTRIES**
- * THE LOSS OF THE UNITED STATES'S POSITION AS THE LEADING EDGE MANUFACTURER OF THE WORLD.**
- * VCRS.**
- * CIVIL RIGHTS**
- * THE GROWTH OF PARTICIPATORY MANAGEMENT IN THE U.S.**
- * THE COMMON USE OF SATELLITE COMMUNICATIONS.**

- * FIBER OPTICS.
- * BREAKING UP OF AT&T AND THE FORMATION OF THE BABY BELLS
- * THE NEW IMPORTANCE OF THE ROLE OF WOMEN IN BUSINESS AND POLITICS.
- * CELLULAR PHONES.
- * THE COLLAPSE OF THE SAVINGS AND LOAN INDUSTRY.
- * FAXING.
- * BIOTECHNOLOGY.

[Barker, Joel Arthur (1992) Future Edge, (pp.22-24)]

THERE IS NO QUESTION WE HAVE UNDERGONE SOME EXTRAORDINARY CHANGES IN THE LAST THIRTY YEARS.

LIKEWISE, JOHN NASBITT, IN HIS BOOK MEGATRENDS HAS SAID "THE NEXT DECADE WILL BE THE MOST IMPORTANT DECADE IN THE HISTORY OF CIVILIZATION.

THAT IT WILL BE:

A PERIOD OF STUNNING TECHNOLOGICAL INNOVATION

A PERIOD OF UNPRECEDENTED ECONOMIC OPPORTUNITY

A PERIOD OF TREMENDOUS POLITICAL REFORM

AN ERA OF GLOBALIZATION WHERE THE

**WORLD IS MOVING FROM INDEPENDENT COUNTRIES
TO A SINGLE ECONOMY AND ONE MARKETPLACE.**

**A WORLD THAT IS MOVING TOWARD THE CAPABILITY TO
COMMUNICATE ANYTHING TO ANYONE ANYWHERE BY ANY FORM
AT THE SPEED OF LIGHT."**

**ANOTHER WRITER HAS DESCRIBED IT "AS IF WE WERE EMERGING FROM
A 20TH CENTURY VERSION OF THE DARK AGES". UNQUESTIONABLY, THE NEXT
DECADE WILL BE A TIME OF ACCELERATING CHANGE-COMPELLING US TO
EXAMINE OURSELVES, OUR VALUES, AND OUR INSTITUTIONS.**

**NOWHERE IS THIS MORE EVIDENT THAN IN THE FIELD OF EDUCATION.
THROUGHOUT THE HISTORY OF EDUCATION THERE HAS ALWAYS BEEN
DISAGREEMENT AMONG EDUCATORS AS TO THE PURPOSE AND FUNCTION OF
EDUCATION.**

**SOME HAVE CONTENDED THAT THE FUNCTION OF EDUCATION IS THAT
OF CULTIVATING THE INTELLECT, DISCIPLINING THE MIND AND HELPING
STUDENTS DEVELOP A SYSTEM OF THOUGHT THAT WILL ENABLE THEM TO
FUNCTION WELL IN SOCIETY.**

**CONVERSELY, OTHERS HAVE CONTENDED THAT INSTITUTIONS OF
LEARNING EXIST TO SERVE SOCIETY AND THAT SCHOOLS, COLLEGES AND
UNIVERSITIES ARE EXPRESSIONS OF THE AGE IN WHICH WE LIVE.**

**REGARDLESS OF THE VIEWPOINT AND PHILOSOPHY OF EDUCATION, TO WHICH
YOU MAY HOLD IT IS EVIDENT AS PETER DRUCKER HAS OBSERVED:**

" EDUCATORS TODAY ARE LIVING IN A TIME OF WRENCHING CHANGE."

[Rist, Marilee (March 1992), Educating for Results, "Leading for Results", (A-2)].

ACCORDING TO PATRICIA CROSS OF HARVARD UNIVERSITY, FOR HIGHER EDUCATION, THIS HAS MEANT THAT "DURING THE PAST THREE DECADES, EDUCATION HAS SWUNG FROM ENERGETIC GROWTH OF CAMPUSES, BUILDINGS, AND ENROLLMENTS TO EQUALLY ENERGETIC RETRENCHMENT, FROM CAMPUS PROTEST TO CAMPUS APATHY, FROM EDUCATIONAL ARROGANCE TO EDUCATIONAL SELF-DOUBT, FROM UNRESERVED OPEN ADMISSIONS TO RIGOROUS ENTRANCE REQUIREMENTS, FROM LONG-RANGE PLANNING TO STRATEGIC MANAGEMENT." [Cross, Pat (1983) IEM Lecture Harvard University]

THE ROLE OF EDUCATION IN OUR SOCIETY IS CHANGING AND WILL CONTINUE TO CHANGE:

- IT IS NO LONGER A QUESTION OF PREPARING CHILDREN AND YOUNG PEOPLE HOW TO MAKE A LIVING,**
- NOR IS IT JUST A QUESTION OF PREPARING STUDENTS HOW TO LIVE IN A CHANGING SOCIETY,**
- IT IS A QUESTION OF PREPARING SCHOOLS, COLLEGES AND UNIVERSITIES TO LIVE IN A CHANGING WORLD.**

WE HAVE ALL HEARD IT SAID THAT THE RAILROADS FAILED, NOT BECAUSE THERE WAS NO LONGER A NEED FOR THEIR SERVICES INDEED THE NEED FOR TRANSPORTATION WAS GROWING AT THE TIME BUT BECAUSE

THE TUNNEL VISION OF THE RAILROAD OPERATORS CONCENTRATED ON RUNNING THE RAILROAD INSTEAD OF EXPLORING THE NEW FRONTIER OF THE TRANSPORTATION INDUSTRY.

SIMILARLY, IN HIS BOOK ENTITLED FUTURE EDGE, JOEL BARKER, SHARES WITH US A TRUE STORY THAT BEGAN IN 1968 THAT COULD SERVE AS A PARABLE FOR EDUCATION:

IN 1968 AND IN 1990, IF ANYONE HAD BEEN ASKED THE QUESTION, WHAT NATION WILL DOMINATE THE WORLD OF WATCHMAKING?

YOU WOULD HAVE EXPECTED THE SAME ANSWER--SWITZERLAND.

BECAUSE SWITZERLAND HAD DOMINATED THE WORLD OF WATCHMAKING FOR THE PAST SIXTY YEARS. THE SWISS MADE THE BEST WATCHES IN THE WORLD. ANYONE WHO WANTED A GOOD WATCH, AND ACCURATE WATCH, BOUGHT A SWISS WATCH.

THEY HAD INVENTED THE MINUTE HAND AND THE SECOND HAND. THEY LED THE RESEARCH IN DISCOVERING BETTER WAYS TO MANUFACTURE THE GEARS, THE BEARINGS, AND THE MAINSPRINGS OF MODERN WATCHES. THEY WERE ON THE CUTTING EDGE OF RESEARCH IN WATERPROOFING WATCHES. THEY BROUGHT TO MARKET THE BEST SELF-WINDING WATCHES. THEY WERE CONSTANT INNOVATORS.

THE SWISS DIDN'T JUST REST ON THEIR LAURELS. THEY CONTINUALLY WORKED AT MAKING BETTER WATCHES.

BY 1968 THEY HAD DONE SO WELL THAT THEY HAD MORE THAN 65 PERCENT OF THE UNIT SALES IN THE WORLD WATCH MARKET AND MORE THAN 80 PERCENT OF THE PROFITS (SOME EXPERTS ESTIMATED AS HIGH AS 90 PERCENT). THEY WERE THE WORLD LEADERS IN WATCHMAKING BY AN ENORMOUS STRETCH. NO ONE WAS EVEN A CLOSE SECOND.

YET, BY 1980 THEIR MARKET SHARE HAD COLLAPSED FROM 65 PERCENT TO LESS THAN 10 PERCENT. THEIR HUGE PROFIT DOMINATION HAD DROPPED TO LESS THAN 20 PERCENT. BY ALL SIGNIFICANT MEASURES, THEY HAD BEEN DETHRONED AS THE WORLD MARKET LEADER.

WHAT HAPPENED?

SOMETHING PROFOUND.

A CHANGE IN THE FUNDAMENTAL RULES OF WATCHMAKING. THE MECHANICAL MECHANISM WAS ABOUT TO GIVE WAY TO ELECTRONICS. EVERYTHING THE SWISS WERE GOOD AT--THE MAKING OF GEARS AND BEARINGS AND MAINSPRINGS--WAS IRRELEVANT TO THE NEW WAY.

AND SO, IN LESS THAN TEN YEARS, THE SWISS WATCHMAKING FUTURE, WHICH HAD SEEMED SO SECURE, SO PROFITABLE, SO DOMINANT, WAS DESTROYED. BETWEEN 1979 AND 1981, FIFTY THOUSAND OF THE SIXTY TWO THOUSAND SWISS WATCHMAKERS LOST THEIR JOBS.

JAPAN, WHICH HAD LESS THAN 1 PERCENT OF THE WORLD WATCH MARKET IN 1968 (EVEN THOUGH THEIR MECHANICAL WATCHES WERE ALMOST AS GOOD AS THOSE OF THE SWISS), WAS IN THE MIDST OF DEVELOPING

WORLD-CLASS ELECTRONIC TECHNOLOGY. SEIKO LED THE CHARGE, AND TODAY THE JAPANESE HAVE ABOUT 33 PERCENT OF THE MARKET.

THE IRONY OF THIS STORY FOR THE SWISS IS THAT THE SITUATION WAS TOTALLY AVOIDABLE.

BECAUSE IT WAS THE SWISS THEMSELVES WHO INVENTED THE ELECTRONIC QUARTZ MOVEMENT. YET, WHEN THE SWISS RESEARCHERS PRESENTED THIS REVOLUTIONARY NEW IDEA TO THE SWISS MANUFACTURERS IN 1967, IT WAS REJECTED.

AFTER ALL, IT DIDN'T HAVE A MAINSPRING, IT DIDN'T NEED BEARINGS, IT REQUIRED ALMOST NO GEARS, IT WAS BATTERY-POWERED, IT WAS ELECTRONIC. IT COULDN'T POSSIBLY BE THE WATCH OF THE FUTURE AND THE REST IS HISTORY." [Barker, Joel Arthur, (1992) Future Edge, (pp. 15-19)]

IN MANY WAYS, THIS IS EXACTLY WHAT IS HAPPENING IN EDUCATION. FOR YEARS EDUCATION IN THE UNITED STATES WAS CONSIDERED TO BE THE BEST IN THE WORLD. TODAY THE POSITION OF AMERICAN EDUCATION IS BEING BROUGHT INTO QUESTION AND AMERICANS WHO "ARGUE HEATEDLY ABOUT NEARLY EVERY ASPECT OF EDUCATION INCLUDING HOW OUR NATIONS SCHOOLS OUGHT TO BE STRUCTURED, FINANCED AND GOVERNED. NOW ALL AGREE ON AT LEAST ONE POINT, RESULTS ARE WHAT THIS COUNTRY ABSOLUTELY MUST HAVE FOR ITS SCHOOLS IF AMERICA IS TO SURVIVE AND THRIVE IN A RAPIDLY CHANGING, INCREASINGLY COMPETITIVE WORLD OF

THE 21ST CENTURY." [Blom, Don E; Shannon, Thomas A., (March 1992) Educating for Results, "Introduction", (pg. A-1)]

IF WE LOOKED TO THE BROAD FUTURE OF EDUCATION WE SEE:

FIRST, A GREATLY INCREASED NEED FOR LEARNING, FOR MORE PEOPLE AND FOR MORE YEARS OF THEIR LIVES.

SECONDLY, A WIDE RANGE OF OFFERINGS AND AN EXPLOSIVE INCREASE IN THE NUMBER OF ORGANIZATIONS PROVIDING EDUCATION.

THIRDLY, A NEW WORLDWIDE PERSPECTIVE OF LIFELONG LEARNING.

ILLUSTRATIVE OF THESE OBSERVATIONS IS WHAT HAS HAPPENED IN HIGHER EDUCATION. THE PERIOD FROM 1955 TO 1974 WAS THE MOST PROSPEROUS EVER EXPERIENCE IN AMERICAN HIGHER EDUCATION.

AS GEORGE KELLER, IN HIS BOOK ENTITLED ACADEMIC STRATEGY REVEALED,"THE STATISTICS OF THIS GOLDEN AGE ARE AWESOME".

1. STUDENT ENROLLMENT INCREASED FROM 2.5 MILLION TO 8.8 MILLION
2. MORE COLLEGE BUILDINGS WERE BUILT DURING THIS 20 YEAR PERIOD THAN DURING THE PREVIOUS 200 YEARS.
3. FACULTY RANKS INCREASED FROM 260,000 TO 633,000.
4. THE ANNUAL PRODUCTION OF M.A. AND M.S. DEGREES ROSE FROM 58,000 TO 278,000.
5. THE ANNUAL PRODUCTION OF DOCTORATES INCREASED FROM 8,800 TO 33,000.

BY THE MID-1970'S, HIGHER EDUCATION BEGAN TO FIZZLE AND BY 1980, IT WAS CLEAR THAT AT BEST A DECADE OF A CHALLENGING TRANSITION LAY AHEAD ONCE AGAIN. [Keller, George, (1983) Academic Strategy (pp. 3-26)]

TODAY MANY FORCES ARE NOW IMPACTING UPON ELEMENTARY, SECONDARY AND HIGHER EDUCATION IN AMERICA AMONG THESE FORCES ARE:

I. COMPETITION FROM NON-COLLEGE AND NON-UNIVERSITY AND NON-EDUCATIONAL SECTORS

COLLEGES AND UNIVERSITIES NO LONGER HAVE A MONOPOLY ON PROVIDING HIGHER EDUCATION INDUSTRY IS SPENDING BILLIONS AND BILLIONS UPON EDUCATION AND TRAINING AND NOW OFFERS CREDIT, DEGREES, LEADING TO PROMOTION, LICENSURE, PERSONAL FULFILLMENT, INTELLECTUAL SIMULATION, PRACTICAL SKILLS, [Cross, Patricia, (1983) IEM Lecture, Harvard University]

BUSINESS CURRENTLY ALLOCATES MORE MONEY FOR EDUCATION AND TRAINING THAN ALL FIFTY STATES COMBINED ALLOCATE FOR HIGHER EDUCATION [Lynton, 1982].

AETNA, XEROX, IBM AND OTHER CORPORATE GIANTS HAVE BUILT CAMPUSES WITH CLASSROOM AND RESIDENCE HALLS THAT SURPASS ANYTHING OFFERED BY MANY OF OUR EXCLUSIVE AND EXPENSIVE COLLEGES AND UNIVERSITIES.

THE ATTITUDE OF THE BUSINESS COMMUNITY IS REFLECTED BY JOHN CARTER, PRESIDENT & CEO, THE EQUITABLE FINANCIAL COMPANIES, WHEN HE SAID: "BUSINESS LEADERSHIP MUST TAKE A MORE ACTIVE ROLE IN IMPLEMENTING AN EFFECTIVE NATIONAL EDUCATION REFORM PROGRAM. WE HAVE A CONSIDERABLE STAKE IN EDUCATION SINCE ITS SUCCESS IS A PRINCIPAL FACTOR SHAPING THE CHARACTER OF THE COUNTRY."

II. DEMOGRAPHICS - THE CHANGING STUDENT CLIENTELE

BY 1990, THERE WAS 1/5 FEWER HIGH SCHOOL GRADUATES AND ONE MILLION FEWER 18 YEARS OLD.

BY 1995, THE COMPOSITION OF THE STUDENT BODIES WILL BE VERY DIFFERENT.

THERE WILL BE FEWER WHITES AND MORE BLACKS.

THERE WILL BE A NEW ARMY OF HISPANIC STUDENTS.

THERE WILL BE A MUCH LARGER NUMBER OF ASIANS.

ONE SURVEY SUGGESTS, "THE U.S. WILL BE PREDOMINATELY A LATIN NATION WITHIN 15 YEARS. OF THE ANTICIPATED POPULATION OF 280 MILLION AT THE TURN OF THE CENTURY 35 MILLION ARE EXPECTED TO BE MEXICAN, CENTRAL AMERICAN OR CARIBBEAN ANCESTRY, 29 MILLION WILL BE ANGLO: 25 MILLION WILL BE GREAT

GRANDCHILDREN OF GERMANS AND MORE THAN 33 MILLION WILL BE DESCENDANTS OF AFRICAN SLAVES."

ANOTHER FACTOR IN DEMOGRAPHICS IS THE AGE OF THOSE ENROLLING IN OUR COLLEGES AND UNIVERSITIES, ADULTS HAVE BEEN AND WILL CONTINUE TO RE-ENTER HIGHER EDUCATION IN UNPRECEDENTED NUMBERS

- 1. UNTIL THE 1970'S, STUDENTS WERE PRIMARILY BETWEEN 17 AND 24 YEARS OLD.**
- 2. IN 1979, THE NATIONAL CENTER FOR EDUCATION ESTIMATED THAT 36% OF AMERICAN STUDENTS WERE 25 YEARS OR OLDER.**
- 3. BY 1995, THE 20-24 AGE GROUP WILL DROP BY 6 MILLION, WHILE THE NUMBER OF AMERICANS BETWEEN THE AGES OF 35-55 WILL HAVE RISEN BY ONE THIRD BRINGING THE NATIONAL MEDIUM AGE TO 35.**

THIS CHANGE IN AGE GROUPS IS ONE OF THE MOST SIGNIFICANT SHIFTS IN HIGHER EDUCATION AND IT IS NOT UNUSUAL TO SEE CORPORATE EXECUTIVES, ENGINEERS, AND MIDDLE-AGE PERSONS PREPARING FOR NEW CAREERS ON CAMPUSES.

III. LIFE LONG LEARNING

HIGHER EDUCATION NO LONGER HAS THE FULL-TIME COMMITMENT OF STUDENTS FOR EXAMPLE, TODAY THERE ARE

APPROXIMATELY 14 MILLION INDIVIDUALS ENROLLED IN HIGHER EDUCATION.

OVER 50% OF THESE INDIVIDUALS ATTEND PART-TIME.

ACCORDING TO BERNICE WARD IN AN ARTICLE ENTITLED LONG DISTANCE LEARNING, "TRADITIONAL EDUCATION APPROACHES MAY BE INADEQUATE TODAY IN SERVING THE DRAMATICALLY SHIFTING NATIONAL DEMOGRAPHICS THAT NOW FIND 30% OF THE STUDENT POPULATION OLDER THAN 24 AND WITH MORE THAN 50% NOW FORCED TO ATTEND COLLEGE PART-TIME. THE NON TRADITIONAL LEARNER IN FACT IS FAST BECOMING THE NORM, WHICH ONLY INCREASES THE DEMAND FOR MORE FLEXIBLE AND INNOVATIVE EDUCATIONAL OPPORTUNITIES.

HISTORICALLY, AMERICA HAS HAD A TENDENCY TO DELINEATE BETWEEN EDUCATION, - WORK - AND LEISURE.

- EDUCATION IS FOR THE YOUNG

- WORK FOR THE MIDDLE AGE

- AND LEISURE FOR THE ELDERLY.

"THIS CONCEPT OF 'LINEAR LIFEPLAN', "IS BEING REPLACED BY A 'BLENDED LIFEPLAN'. EDUCATION, WORK AND LEISURE ARE CONCURRENT THROUGHOUT THE LIFE-SPAN OF THE INDIVIDUAL." [Cross, Patricia (1983), IEM Lecture, Harvard University]

IV. THE TECHNOLOGICAL & INFORMATION REVOLUTION

THERE IS WIDESPREAD AGREEMENT NOW THAT A MAJOR REVOLUTION CONTINUES TO FERMENT IN SOCIETY. IT HAS BEEN CALLED THE THIRD WAVE, THE INFORMATION SOCIETY, AND THE TECHNOLOGICAL REVOLUTION. WHATEVER ITS NOMENCLATURE, THE DIRECTION SEEMS CLEAR - JOBS, THE ECONOMY, AND LIFESTYLES WILL BE BASED ON THE CREATION AND DISTRIBUTION OF INFORMATION. IN 1950, ONLY 17 PER CENT OF THE JOBS IN AMERICA INVOLVED PROCESSING OF INFORMATION:

TODAY MORE THAN 70 PER CENT OF ALL WORKERS ARE CREATING, PROCESSING OR DISTRIBUTING INFORMATION.

- EDUCATIONALLY, NEW DEVELOPMENTS IN COMPUTER SCIENCE HAVE ALREADY SIGNIFICANTLY ALTERED THE ACADEMIC PROCESS.
- TODAY WE ARE EXPERIENCING AN EXPLOSION OF KNOWLEDGE.
- IT IS CREATED FASTER THAN IT CAN BE LEARNED OR TAUGHT
- AT LEAST 10,000 SCIENTIFIC ARTICLES ARE WRITTEN EACH DAY (ONE EVERY THIRTY SECONDS) AND INFORMATION DOUBLES EVERY 3-5 YEARS.

THE PROBLEM FOR THE FUTURE IS NOT THE SUPPLY OF INFORMATION, BUT THE SELECTION. TEACHERS WHO SEE THEIR ROLE

ONLY AS PROVIDERS OF INFORMATION CAN AND WILL BE UPSTAGED BY TECHNOLOGY.

TEACHERS WHO NURTURE, INSPIRE, AND ASSIST IN COGNITIVE GROWTH AND INTELLECTUAL DEVELOPMENT WILL BE IN GREAT DEMAND IN THE TECHNOLOGICAL AGE.

ELECTRONICS IS ALSO CHANGING OUR IDEA OF THE BASIC INGREDIENTS OF AN EDUCATION. LIKE ENGLISH COMPOSITION IS A REQUIREMENT FOR ALL UNDERGRADUATES.

COMPUTERS ARE NOW AS ESSENTIAL AS CHALKBOARDS, TEST TUBES, AND SCHOLARLY PERIODICALS.

THE MODEL LIBRARY OF THE FUTURE WILL ELIMINATE 80% OF ITS BOOKS WITH INTERACTIVE VIDEO DISCS AND COMPUTERIZATION MAKING INFORMATION ACCESSIBLE TO STUDENTS AROUND THE WORLD [Hallett, Jeffrey, (1990) "Learning & Working in the 90's: The Needed Revolution", Jeffrey J. Hallett, (pg. 13)].

NEW TECHNOLOGY IS DOING AT LEAST AS MUCH TO EDUCATION AS TELEVISION HAS DONE TO NEWSPAPERS.

IN 1981, THERE WERE ABOUT 730,000 COMPUTER SYSTEMS IN OPERATION IN THE UNITED STATES WITH AN ESTIMATED 5 MILLION COMPUTER TERMINALS.

ACCORDING TO AN INTERNATIONAL DATA CORPORATION STUDY, BY 1995 THE NUMBER OF SYSTEMS IS EXPECTED TO DOUBLE AND THE NUMBER OF TERMINALS TO TRIPLE.

NEARLY 70% OF AMERICA'S WORK FORCE IS ENGAGED IN PROCESSING INFORMATION OF SOME KIND.

EXACTLY HOW COMPUTERS ARE TO BE INSERTED INTO EVERYDAY SCHOOL LIFE AND HOW THEY ARE TO BE PAID FOR IS OF GREAT CONCERN FOR EDUCATIONAL LEADERS FOR THE IMMEDIATE FUTURE.

"IF EDUCATOR'S ARE TO KEEP PACE WITH THE CHANGING WORLD, WE'VE GOT TO REMEMBER IT'S A BABY TECHNOLOGY AND A BABY SCIENCE. EVERYTHING WE'VE SEEN WITH COMPUTERS SO FAR HAS HAPPENED IN A VERY SHORT PERIOD OF TIME. IN 1977, 100 PERCENT OF THE WORLD'S COMPUTING WAS DONE BY MAIN-FRAMES. IN 1987, 10 YEARS LATER, 1 PERCENT WAS DONE BY MAIN-FRAMES, AND 99 PERCENT WAS DONE BY DISTRIBUTED TERMINALS, MINIS OR PERSONAL COMPUTERS AND WORKSTATIONS. THAT'S AN EXTRAORDINARY AMOUNT OF CHANGE. AND NOW PEOPLE ARE TALKING ABOUT THE DEVELOPMENT OF CHIPS THAT ARE 1,000 TIMES FASTER THAN THE FASTEST COMPUTERS TODAY. THE COMPUTER DOESN'T CARE WHETHER YOU'RE AN ENGINEER, OR PHYSICIAN, OR ARTIST, OR

MUSICIAN, OR 70 YEARS OLD, OR SIX YEARS OLD, OR GREEN, OR YELLOW, OR MALE, OR FEMALE! IT IS THERE FOR ANYBODY AND IT IS GOING TO CHANGE THE WORLD IN WAYS WE CAN'T IMAGINE BECAUSE IT ALLOWS US TO DO THINGS IN OUR MINDS AND IN OUR HEARTS WHAT WE'VE NEVER BEEN ABLE TO DO BEFORE OR EVEN THOUGHT OF BEFORE."

[Hallett, Jeffrey (1990) "Learning and Working in the 1990's" The Needed Revolution", (pg. 7)]

ACCORDING TO THE NATIONAL ALLIANCE OF BUSINESS IN AN ARTICLE ENTITLED "THE DISAPPEARING QUALITY OF THE U.S. WORK FORCE" "THE PLAIN TRUTH IS AMERICA IS STUMBLING TOWARD THE 21ST CENTURY WITH AN EDUCATIONAL SYSTEM MIRED IN THE 19TH CENTURY THAT'S DESIGNED FOR A TOTALLY DIFFERENT WORKPLACE AND SOCIAL CONDITIONS. INSTITUTIONS OF LEARNING ARE DEALING WITH VERY DIFFERENT STUDENTS TODAY AND ARE SHOULDERING A VARIETY OF NEW RESPONSIBILITIES AND PROBLEMS."

AS ALWAYS, AS FORCES COME INTO PLAY, TRENDS ALSO DEVELOP AND IN THE FIELD OF EDUCATION SEVERAL TRENDS ARE COMING TO THE FOREFRONT. AMONG THESE TRENDS ARE:

1. CHOICE--THE ABILITY OF THE PARENT TO CHOOSE WHICH SCHOOL THE STUDENT SHOULD ATTEND IS STILL VERY MUCH AT

THE FOREFRONT. EVEN THOUGH EDUCATIONAL CHOICE APPEARS DEAD LOCKED ON CAPITAL HILL AT THE MOMENT, THE POLLS INDICATE THAT THE PUBLIC IS GROWING INCREASINGLY INTERESTED IN IT.

"THE EVIDENCE THAT U.S. SCHOOLS ARE NOT WORKING WELL IS DEPRESSINGLY FAMILIAR. ONE IN FIVE YOUNG AMERICANS DROPS OUT OF HIGH SCHOOL. NEARLY HALF OF ALL HIGH SCHOOL GRADUATES HAVE NOT MASTERED SEVENTH GRADE ARITHMETIC. AMERICAN 13 YEAR-OLDS PLACE NEAR THE BOTTOM IN SCIENCE AND MATH ACHIEVEMENT IN INTERNATIONAL COMPARISONS. ONE-THIRD OF 19-YEAR-OLDS CANNOT PLACE FRANCE ON A MAP OF THE WORLD. ONLY ABOUT ONE IN 10 HIGH SCHOOL GRADUATES CAN WRITE A REASONABLE COHERENT PARAGRAPH OR HANDLE PRE-COLLEGE MATHEMATICS." [The Wall Street Journal, Friday, June 5, 1992, "Educational Innovation", p.10].

PERHAPS NO SINGLE FACTOR HAS SERVED AS A CATALYST ON THIS ISSUE OF SCHOOL CHOICE THAN THE EDISON PROJECT. THAT'S THE NEWEST BRANCHILD OF CHRISTOPHER WHITTLE, THE HIGH-FLYING ENTREPRENEUR WHO HAS MADE MILLIONS FUZZING THE LINES BETWEEN ADVERTISING, EDUCATION AND PUBLISHING.

"MR. WHITTLE LURED THOUSANDS OF PUBLIC HIGH

SCHOOLS INTO REQUIRING CAPTIVE STUDENTS TO WATCH TV COMMERCIALS IN CLASS BY WRAPPING THEM IN A NEWSCAST AND LENDING SCHOOLS TV EQUIPMENT TO SHOW THEM".

"NOW MR. WHITTLE INTENDS TO CREATE A NATIONAL CHAIN OF 1,000 FOR PROFIT SCHOOLS THAT HE SAYS WILL PROVIDE BETTER EDUCATION AT THE SAME PER-CAPITA COST AS PUBLIC SCHOOLS DO NOW--AND OFFER INVESTMENT OPPORTUNITIES AT THE SAME TIME. THE FIRST 200 SCHOOLS, WITH AN ENROLLMENT OF 150,000 ARE TO BE IN OPERATION BY 1996: THE REST, WITH 2 MILLION STUDENTS, BY 2010".

"MR. WHITTEL AND HIS CORPORATE PARTNERS ARE PUTTING UP AN INITIAL \$60 MILLION FOR A THREE-YEAR DESIGN PHASE, WHICH IS ALREADY UNDER WAY AND FOR WHICH EDUCATORS AND PLANNERS ARE BEING RECRUITED". [The Wall Street Journal, Friday, June 5, 1992, "Educational Innovation", p.10]

REGARDLESS WHETHER OR NOT YOU SUPPORT THE EDISON PROJECT CONCEPT, IT IS BELIEVED BY MANY THAT SCHOOL CHOICE WOULD EVENTUALLY RESULT IN THE STRENGTHENING OF EFFECTIVE SCHOOLS AND ELIMINATING THE INEFFECTIVE SCHOOLS.

2. LITERACY--DURING THE NEXT TEN YEARS, FEDERAL, STATE AND LOCAL GOVERNMENTS, WILL BE FOCUSING MORE AND MORE ON UPGRADING BASIC LITERACY SKILLS, AS WELL AS ON ENHANCING CULTURAL AND COMPUTER LITERACY FOR ALL AMERICANS--NOT ONLY TO IMPROVE OUR WORKFORCE AND MAKE US GLOBALLY COMPETITIVE, BUT ALSO AS A MEANS OF REDUCING UNEMPLOYMENT, ENCOURAGING GREATER CIVIC RESPONSIBILITY, AND NURTURING A SHARED AMERICAN IDENTITY (IN A POPULATION THAT WILL BE INCREASINGLY DIVERSE--DEMOGRAPHICALLY).

3. NATIONAL STANDARDS, TESTING AND GLOBAL COMPETITIVENESS--
IT SEEMS LIKELY THAT THE CURRENT EMPHASIS ON IMPROVING STUDENT OUTCOMES WILL LEAD TO RIGOROUS NATIONAL STANDARDS--WHICH WILL PROBABLY BE TOUTED AT HOME AS A WAY OF INCREASING TEACHER AND STUDENT ACCOUNTABILITY AND ABROAD WILL BE INTERPRETED AS A SIGN OF AMERICA'S DETERMINATION TO REGAIN IT'S COMPETITIVE EDGE INTERNATIONALLY.

4. SCHOOL READINESS--"AT A TIME WHEN ALMOST ONE-FIFTH OF ALL THE CHILDREN IN AMERICA ARE BORN OUT OF WEDLOCK,

LARGE NUMBERS OF CHILDREN LIVE BELOW THE POVERTY LINE AND SIXTY PERCENT OF THE CURRENT GENERATION OF STUDENTS WILL, AT SOME TIME IN THEIR CHILDHOOD YEARS, LIVE IN A BROKEN HOME. THE NATURE AND CONFIGURATION OF THE FAMILY WILL CHANGE VIRTUALLY BEYOND RECOGNITION. FOR EXAMPLE, THE NUMBER OF TRADITIONAL MOTHERS WHO STAY HOME AND RAISE CHILDREN NOW ONLY 24 PERCENT OF ALL ADULT WOMEN, WILL SHRINK EVEN FURTHER TO LESS THAN 10 PERCENT. ASSUMING THAT 10 PERCENT WILL BE HAVING BABIES OR BE CHRONICALLY ILL OR OUT OF THE LABOR FORCE FOR OTHER REASONS, IT IS SOUND TO PREDICT THAT EIGHT IN TEN ADULT WOMEN WILL BE WORKING BY THE YEAR 2001, AS COMPARED WITH 64 PERCENT TODAY. WORKING WILL BE VIEWED AS AN ACCEPTED FACT OF LIFE. INDEED THERE WILL BE ALMOST AS MANY WORKING WOMEN AS MEN." [The College Board Review, No 150, Winter, 1988-89, "2001: The World Our Students Will Enter", Pg. 23]

STATE AND FEDERAL GOVERNMENTS WILL BE FOCUSING MORE RESOURCES ON MINIMIZING THE EFFECTS SITUATIONS CAUSED BY EMPLOYMENT AND ECONOMIC NEEDS OF PARENTS, AS WELL AS ON PROVIDING EDUCATIONAL REMEDIATION SO THAT ALL STUDENTS START SCHOOL READY TO LEARN.

5. VOCATIONAL EDUCATION/TRANSITION TO THE WORKFORCE, AS BUSINESS AND INDUSTRY MOVE INTO THE INFORMATION AGE, IN WHICH TECHNICAL COMPETENCY WILL BE DEMANDED OF A MAJORITY OF WORKERS, VOCATIONAL EDUCATION WILL NEED TO BE FURTHER RETOOLED AND APPRENTICESHIP PROGRAMS STRESSING INFORMATION, TECHNOLOGY, AND SERVICE (THE GROWTH INDUSTRIES OF THE FUTURE) WILL BE INITIATED TO EASE THE SCHOOL-TO-JOB TRANSITION, WHICH IS CURRENTLY SO NEGLECTED.

"ONE OF THE THINGS THAT NEEDS TO BE CORRECTED IS THE PERCEIVED VALUE OF THIS OTHER PART OF AMERICAN EDUCATION CALLED "VOC-TECH". YOU KNOW WHAT VOC-TECH'S FOR? THE DUMB KIDS! THE DUMB KIDS GO TO VOC-TECH! SMART KIDS TO COLLEGE PREPARATORY COURSES, RIGHT? THE SINGLE MOST DRIVING NEED WE ALL HAVE IS TO DEVELOP SERIOUS APPRECIATION FOR THE SKILL, UNDERSTANDING, MAINTENANCE, USE AND WORK NEEDED WITH THE TOOLS AND TECHNOLOGIES CALLED VOC-TECH. TODAY, IT IS STILL SECOND CLASS." [Hallett, Jeffrey, J. (1990) Learning and Working in the 90's: The Needed Revolution, (pg. 11)]

6. FINANCING HIGHER EDUCATION--WITH A SHRINKING POOL OF COLLEGE APPLICANTS (OF THE TRADITIONAL AGE) AND INCREASINGLY SCARCE FEDERAL AND STATE DOLLARS TO FUND HIGHER EDUCATION, ONE OF THE GREAT CHALLENGES TO AMERICAN EDUCATORS, STUDENTS AND THEIR PARENTS WILL BE FINDING CREATIVE WAYS TO UNDERWRITE AND CONTAIN THE MUSHROOMING COSTS OF POST-SECONDARY EDUCATION. MANY ADMINISTRATORS WILL FACE THE "DOUBLE SQUEEZE"-SHRINKING PUBLIC FUNDING COUPLED WITH STUDENTS' INABILITY TO PAY FULL FEES ON ONE SIDE AND INCREASING COSTS FOR MAINTENANCE OF THE PHYSICAL PLANT, FACULTY SALARIES, LIBRARY EXPANSION, UPDATING COMPUTER AND SCIENCE EQUIPMENT, AND SCHOLARSHIP NEEDS ON THE OTHER.

7. SCHOOL-BUSINESS PARTNERSHIPS--THIS DISTINCTIVE KIND OF EDUCATIONAL PARTNERSHIP, WHICH CAME OF AGE IN THE EIGHTIES, PARTLY AS A RESULT OF BUSINESS'S PERCEPTION THAT THE SCHOOLS WERE NOT TURNING OUT THE KIND OF GRADUATES THAT WOULD MAKE GOOD EMPLOYEES, SEEMS LIKELY TO SNOWBALL IN THE NINETIES, WITH COMPANIES BEGINNING TO DEMAND GREATER ACCOUNTABILITY FROM SCHOOLS AND SIMULTANEOUSLY TAILORING THEIR BUSINESSES AND

PROGRAMS TO MEET THEIR NEEDS AND THEIR OWN PHILANTHROPY TO SUBJECTS THAT DIRECTLY RELATE TO THEIR BUSINESS INTERESTS. IN OTHER WORDS, LOOK FOR LARGER GIFTS, BUT ALSO MORE DISCRIMINATING CHOICES AND MORE CAREFUL ASSESSMENT OF RESULTS.

FOR EXAMPLE "MOTOROLA HAS BEEN EXTREMELY SUCCESSFUL LATELY IN COMPETING IN THE GLOBAL MARKET WITH THE JAPANESE BY PRODUCING SOME OF TODAY'S MOST INNOVATIVE, HIGH-QUALITY PRODUCTS, INCLUDING SMALL HAND-HELD TELEPHONES THAT HAVE ROCKED THE CELLULAR TELEPHONE WORLD. TO CONTINUE THIS LEVEL OF GLOBAL SUCCESS, MOTOROLA NOW BELIEVES IT NEEDS EVERYBODY IN THAT ORGANIZATION TO BE IN FORMAL TRAINING ONE DAY A WEEK. FOUR DAYS WORKING; ONE DAY LEARNING--AND THERE'S GOING TO BE MORE AND MORE OF THIS TYPE OF SCHEDULE THROUGHOUT INDUSTRY." [Hallett, Jeffrey, J., (1990) *Learning and Working in the 90's: The Needed Revolution*, (pg. 10)]

8. RESTRUCTURING SCHOOLS--AS A RESULT OF AMERICA'S NATIONAL EMPHASIS ON SCHOOLS THAT BREAK THE MOLD AND THE INNOVATIVE ACTIVITIES CARRIED OUT BY THE AMERICAN

SCHOOLS DEVELOPMENT CORPORATION, IT SEEMS LIKELY THAT THE NEXT TEN YEARS WILL BE A PERIOD OF INTENSIVE EXPERIMENTING WITH RESTRUCTURING IN VIRTUALLY EVERY DEPARTMENT--THE LENGTH OF THE SCHOOL DAY AND YEAR, THE ORGANIZATION OF TIME AND CLASSES, THE USE OF SCHOOLS WITHIN SCHOOLS, NEW FORMS OF REMEDIATION AND ACCELERATION, REFORMS IN THE CURRICULUM, DIVERSE MODES OF TEACHING AND LEARNING.

9. UPGRADING AND REFORMING TEACHER TRAINING--THIS WOULD INCLUDE STIFFER ADMISSION STANDARDS FOR THOSE SEEKING TO TEACH, MORE SUBSTANTIVE COURSES OF STUDY FOR WOULD-BE TEACHERS, INCREASED USE OF SECOND-CAREER INDIVIDUALS TO FILL VACANCY SLOTS FOR MATH, SCIENCE, COMPUTER INSTRUCTION, AND FOREIGN LANGUAGES, AND , POSSIBLY, HIGHER REMUNERATION FOR TEACHERS (BASED ON SOME KIND OF MERIT PAY CONCEPT--WITH A BUILT-IN SLOT AT THE TOP OF THE TEACHING PROFESSION FOR CERTIFIED MASTER TEACHERS WHO WOULD NOT ONLY EARN MORE BUT WHO WOULD ALSO BE USED EXTENSIVELY AS MENTORS FOR BEGINNING INSTRUCTORS AND OTHERS WITH PARTICULARLY DIFFICULT PROFESSIONAL PROBLEMS.

10. MULTICULTURAL EDUCATION--"OVER A THIRD OF THE ENTIRE POPULATION OF THIS COUNTRY WILL BE NONWHITE MINORITY BY THE TURN OF THE CENTURY. IF POPULATION TRENDS CONTINUE, IT IS NOT INCONCEIVABLE THAT CLOSE TO A MAJORITY OF THE CHILDREN UNDER 18 WILL BE NONWHITE MINORITY GROUP MEMBERS. THESE STATISTICS REVEAL THE ESSENCE OF THE CHALLENGE OF SURVIVAL AMERICA FACES. TO PUT IT BLUNTLY AND CATEGORICALLY: BY THE END OF THE NEXT DECADE, THE U.S. WILL HAVE EITHER SUCCEEDED OR FAILED ON THE PIVOTAL ISSUE OF HOW TO OPEN THE DOORS OF OPPORTUNITY TO MINORITY YOUNG PEOPLE." [The College Board Review, No 150, Winter, 88-89, "The World Our Student Will Enter", pg. 23]

IN LIGHT OF THE CURRENT DEMOGRAPHIC TRENDS, IT SEEMS LIKELY THAT THE CURRENT DEBATES ABOUT MULTICULTURAL EDUCATION AND POLITICAL CORRECTNESS WILL CONTINUE UNTIL WE REACH A PUBLIC CONSENSUS CONCERNING WHAT THE CORE IS OF OUR NATIONAL IDENTITY AS AMERICANS AND WHICH ASPECTS OF THAT CORE SHOULD BE TRANSMITTED TO SCHOOL CHILDREN.

"FOR ALL INSTITUTIONS, OUR GREATEST ACHIEVEMENTS WILL COME WHEN THE MISSION IS CLEAR AND COMPELLING AND WHEN EVERY LEADER HAS LEARNED THE ANSWERS TO THE QUESTIONS: WHAT IS OUR BUSINESS? WHO IS THE CUSTOMER? AND WHAT DOES THE CUSTOMER CONSIDER VALUE? THEN, THE ORGANIZATION WILL BE MISSION-FOCUSED, VALUE-BASED, AND DEMOGRAPHICS-DRIVEN. CHANGED LIVES IS THE BOTTOM LINE FOR ALL OF US. WHEN AS LEADERS WE DO WHAT WE DO WELL, WE TRANSFORM LIVES. IN DOING SO, WE TRANSFORM OUR INSTITUTIONS, AND IN THE END, WE OURSELVES ARE TRANSFORMED." [Hesselbein, Frances (March 1992), Educating for Results, "The Effective Organization" (A-17)]