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PATHWAYS TO PROGRESS

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AS EACH OF US KNOWS SO WELL, HISTORY IS MADE BY INDIVIDUALS. EACH OF YOU, OHIO STATE'S 1982 GRADUATES, WILL MAKE HISTORY! YOUR WORDS AND DEEDS, BE THEY GOOD OR BAD, WILL ADD TO OR DETRACT FROM OHIO STATE UNIVERSITY'S CONTRIBUTION TO OUR STATE, THE NATION AND THE WORLD. EVERY PERSON IN THIS STADIUM WISHES YOU WELL, BUT IT IS YOU WHO MUST DETERMINE WHETHER YOU WILL IN FACT ACHIEVE THE POTENTIAL FOR WHICH YOUR EDUCATION HAS PREPARED YOU.

WHATEVER PATHS YOU MAY FOLLOW, AND WHATEVER YOUR SUCCESSES MAY BE, YOU WILL BE LIVING AND WORKING IN A RAPIDLY CHANGING WORLD. UNFORTUNATELY, SOME INDIVIDUALS IN OUR SOCIETY HAVE RESPONDED TO THE TURBULENCE OF OUR TIMES BY "COPPING OUT." BUT "COPPING OUT" ENTAILS A WASTE OF TALENT AND ENERGY WHICH OUR NATION AND OUR WORLD CAN ILL AFFORD. BY HAVING EARNED YOUR DEGREE FROM OHIO STATE YOU HAVE DEMONSTRATED YOUR CAPACITY TO ACHIEVE. I AM CONFIDENT THAT EACH OF YOU IS DETERMINED TO SUCCEED, AND EACH OF YOU WILL BE A CREDIT TO YOURSELVES, TO YOUR FAMILIES AND

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TO YOUR ALMA MATER. SUCCESS HAS CHARACTERIZED OHIO STATE GRADUATES THROUGHOUT THE PAST 104 YEARS DURING WHICH TIME THE RANKS OF OHIO STATE'S GRADUATING CLASSES HAVE GROWN FROM JUST SIX MEN AND WOMEN IN THE CLASS OF 1878 TO THE 10,711 WHO WILL HAVE GRADUATED FROM OHIO STATE SINCE OUR COMMENCEMENT EXERCISES JUST ONE YEAR AGO.

WHETHER WE LIKE IT OR NOT, THE YEARS WHICH HAVE GONE BY SINCE OHIO STATE GRADUATED ITS FIRST CLASS HAVE LED US INTO AN INCREASINGLY INTERDEPENDENT WORLD! OUR PROGRESS IN SCIENCE AND TECHNOLOGY OVER THE PAST CENTURY HAS BEEN BUT THE LOGICAL CONSEQUENCE OF AN ADVANCING LEVEL OF EDUCATIONAL ATTAINMENT BOTH HERE IN THE UNITED STATES AND WORLDWIDE. NEW KNOWLEDGE HAS FUELED MAN'S PROGRESS THROUGH THE AGES AND IT WILL CONTINUE TO DO SO. TWO OF THE DEVELOPMENTS WHICH HAVE MADE OUR WORLD INTO AN ECONOMICALLY INTERDEPENDENT GLOBAL VILLAGE ARE UNQUESTIONABLY THE JET AIRPLANE AND MORE RECENTLY, THE COMMUNICATIONS SATELLITES. JOHN NAISBITT ², SENIOR VICE PRESIDENT OF YANKELOVICH, SKELLY, AND WHITE, DESCRIBED OUR PRESENT-DAY WORLD IN RATHER DRAMATIC TERMS IN A SPEECH ENTITLED, "READING THE TRENDS OF THE '80'S." IN THAT SPEECH MR. NAISBITT MADE THE FOLLOWING OBSERVATIONS, AND I QUOTE: "AS PART OF THE WORLD THAT IS SUDDENLY, FOR THE FIRST TIME, A TRULY INTEGRATED ECONOMY BECAUSE OF INSTANTANEOUSLY

SHARED INFORMATION, WE ON THIS GLOBE ARE PROFOUNDLY IN THE PROCESS OF RESORTING OUT WHO IS GOING TO MAKE WHAT. WE ARE ENGAGED IN A PROCESS OF THE REDIVISION OF LABOR AND PRODUCTION, AND AS PART OF THAT, ALL OF THE DEVELOPED COUNTRIES OF THIS WORLD ARE IN THE PROCESS OF DE-INDUSTRIALIZING . . ."

"THE UNITED STATES IS PART OF THIS PROCESS. THE UNITED STATES AND THE REST OF THE DEVELOPED COUNTRIES ARE ON THE WAY TO LOSING AS WE KNOW IT TODAY, THE STEEL INDUSTRY, THE AUTOMOBILE INDUSTRY, THE RAILROAD EQUIPMENT INDUSTRY, THE MACHINERY INDUSTRY, THE APPLIANCE INDUSTRY, THE TEXTILE INDUSTRY, THE SHOE INDUSTRY, THE APPAREL INDUSTRY, AND SO ON, AS THE THIRD WORLD TAKES OVER SOME OF THESE TASKS . . ." MR. NAISBITT GOES ON TO SAY, "THE WORLD IS CHANGING. RAILROADING WAS OUR NUMBER ONE INDUSTRY NOT SO MANY YEARS AGO. WE CELEBRATED THE PENNSYLVANIA RAILROAD AS THE BEST MANAGED ENTERPRISE IN THE LAND. BUT THE WORLD CHANGED. JUST SINCE 1960 OUR SHARE OF THE EXPORT PIE OF THE WORLD HAS DROPPED FROM 18 PERCENT DOWN TO 12 PERCENT."

"THE UNITED KINGDOM MANAGED IN A COUPLE OF GENERATIONS, GROWING AT A PERCENTAGE POINT LESS THAN FRANCE, GERMANY, AND THE U.S., TO TRANSFORM ITSELF FROM THE WEALTHIEST SOCIETY ON EARTH TO A RELATIVELY POOR MEMBER OF THE COMMON MARKET . . ."

"IT IS IN THIS ENVIRONMENT, I THINK, THAT WE HAVE TO VIEW THE CHRYSLER BAILOUT. GOING DOWN THE PATH TO A CHRYSLER BAILOUT

IS THE PATH THAT IS TURNING THE AUTOMOBILE INDUSTRY IN THIS COUNTRY INTO AN EMPLOYMENT PROGRAM THE WAY BRITAIN TURNED ITS AUTOMOBILE AND STEEL INDUSTRIES INTO EMPLOYMENT PROGRAMS. THERE ARE NOT GOING TO BE MANY AUTOMOBILE COMPANIES LEFT. THROUGH MERGERS AND JOINT VENTURES AND COOPERATIVE AGREEMENTS, WE'RE GOING TO CREATE TRANSNATIONAL AUTOMOBILE COMPANIES AND THAT'S WELL UNDERWAY. THIS WILL BE THE FIRST INDUSTRY TO BE GLOBALIZED AND THAT WILL BE A MODEL FOR OTHER INDUSTRIES. THE 30 AUTOMOBILE COMPANIES NOW COMPETING ON AN INTERNATIONAL SCALE, I THINK, WILL BE REDUCED TO A SHEER SEVEN OR EIGHT COMPANIES OR ALLIANCES OF COMPANIES BY THE END OF THE 80s . . ." END OF QUOTE.

WHAT ALL OF THIS SAYS TO ME IS THAT WE IN THE UNITED STATES MUST FIRST OF ALL CONCENTRATE OUR EFFORTS ON THOSE PRESENTLY STRONG INDUSTRIES SUCH AS AGRICULTURE WHERE WE HAVE A SIGNIFICANT COMPETITIVE ADVANTAGE WHILE AT THE SAME TIME DIRECTING OUR EDUCATIONAL AND FISCAL RESOURCES TOWARD THE NEWER MORE EXCITING INDUSTRIES INCLUDING BIOTECHNOLOGY, ELECTRONICS, ALTERNATIVE ENERGY SOURCES AND BIOMEDICAL ENDEAVORS.

I HAPPEN TO BELIEVE THAT RESEARCH AND EDUCATION, ALONG WITH RENEWED EMPHASIS ON PERSONAL DISCIPLINE AND THE WORK ETHIC, WILL ENABLE US TO REMAIN COMPETITIVE IN ALL THE AREAS WHERE WE HAVE LONG BEEN WORLD LEADERS AND BECAUSE OF NATURAL RESOURCE

ADVANTAGES ARE IN POSITION TO CONTINUE AS A WORLDWIDE PACE SETTER. BECAUSE OF ITS PAST GROWTH AND PRESENT SUPERIORITY, AGRICULTURE IS ONE OF OUR NATION'S MOST EXCITING GROWTH INDUSTRIES. WORLDWIDE DEMAND FOR FOOD HAS INCREASED BY 28% OVER THE PAST 10 YEARS! THE PROJECTED INCREASE OVER THE NEXT 20 YEARS RANGES FROM 60 TO 85%. EXPORT DEMAND IS EXPECTED TO BE 10 TIMES AS GREAT AS THE INCREASE IN DOMESTIC DEMAND BETWEEN NOW AND THE YEAR 2000. THAT IS AN ALMOST UNBELIEVABLE PROJECTION OF INCREASE FOR AGRICULTURAL EXPORTS. BUT THE RECORD SUBSTANTIATES THE TREND! IN 1970 WE EXPORTED HALF OF OUR WHEAT PRODUCTION; LAST YEAR WE EXPORTED TWO-THIRDS OF IT. SIMILAR DIMENSIONS OF GROWTH HAVE PREVAILED FOR RICE. FOR COTTON, WE EXPORTED MORE THAN ONE-THIRD OF OUR CROP IN 1970; LAST YEAR, WE EXPORTED MORE THAN HALF. FOR GRAIN SORGHUM, WE EXPORTED 21% IN 1970; LAST YEAR, MORE THAN HALF. FOR CORN, WE EXPORTED 12% OF OUR PRODUCTION IN 1970; LAST YEAR, THREE TIMES THAT AMOUNT--36% OF IT. SIMILARLY IN RECENT YEARS WE HAVE BEEN EXPORTING MORE THAN HALF OF OUR SOYBEAN CROP.

AGRICULTURE IS THE WORLD'S LARGEST INDUSTRY! IT IS THE LARGEST INDUSTRY IN THE UNITED STATES AND IT IS THE LARGEST INDUSTRY IN OHIO. IT'S GOING TO BE EVEN LARGER IN THE FUTURE BECAUSE WORLD POPULATION IS INCREASING AT THE SAME TIME AS THERE IS A RISING TIDE OF EXPECTATION RELATIVE TO FOOD SUPPLY AND THE NUTRITIONAL ADEQUACY

OF THAT FOOD SUPPLY. THE 4.6 BILLION PEOPLE PRESENTLY POPULATING THE EARTH WILL INCREASE BY AN ESTIMATED 50% BY THE YEAR 2000.

INCREASING NUMBERS OF CONCERNED PEOPLE ARE NOW ASKING WHETHER IT WILL BE POSSIBLE FOR THE WORLD'S AGRICULTURAL INDUSTRY TO FEED OUR WORLD'S BURGEONING POPULATION. AS FAR AS I AM CONCERNED, THE ANSWER IS YES. BUT ONLY IF IN THE DEVELOPING COUNTRIES A SYSTEM OF RESEARCH AND EDUCATION SIMILAR TO THE LAND-GRANT UNIVERSITY SYSTEM IN THIS COUNTRY IS ADOPTED AND SUPPORTED BY THOSE DEVELOPING NATIONS.

I MENTION THE LAND-GRANT UNIVERSITY SYSTEM BECAUSE EACH MEMBER OF THIS GRADUATING CLASS HAS REASON TO BE PROUD OF THE FACT THAT HE OR SHE IS BEING GRADUATED FROM OHIO'S LAND-GRANT UNIVERSITY, THE OHIO STATE UNIVERSITY.

THE LAND-GRANT SYSTEM, AS IT IS CALLED, CAME INTO BEING DURING THE DARKEST DAYS OF THE CIVIL WAR AT WHICH TIME ABRAHAM LINCOLN SIGNED INTO LAW THE MORRILL ACT, NAMED AFTER SENATOR JUSTIN MORRILL OF VERMONT. THIS LEGISLATION PROVIDED FEDERALLY-OWNED LANDS TO EACH AND EVERY STATE WHICH WOULD AGREE TO ACCEPT THE PROVISIONS OF THE SO-CALLED LAND-GRANT ACT OF 1862. THOSE PROVISIONS WERE RATHER SIMPLE. EACH STATE WHICH ACCEPTED PROVISIONS OF THE ACT WAS TO RECEIVE 30,000 ACRES OF LAND FOR EACH MEMBER OF THE CONGRESS FROM THAT STATE. THE PURPOSES TO WHICH THAT

GRANT OF LAND WERE TO BE DIRECTED ARE SPECIFIED IN THE PRECISE WORDS OF THE LEGISLATION, AND I QUOTE: "SUCH LANDS SHALL BE INVIOLEABLY APPROPRIATED, BY EACH STATE WHICH MAY TAKE AND CLAIM THE BENEFITS OF THIS ACT, TO THE ENDOWMENT, SUPPORT, AND MAINTENANCE OF AT LEAST ONE COLLEGE WHERE THE LEADING OBJECT SHALL BE, WITHOUT EXCLUDING OTHER SCIENTIFIC AND CLASSICAL STUDIES, AND INCLUDING MILITARY TACTICS, TO TEACH SUCH BRANCHES OF LEARNING AS ARE RELATED TO AGRICULTURE AND THE MECHANIC ARTS, IN SUCH MANNER AS THE LEGISLATURES OF THE STATES MAY RESPECTIVELY PRESCRIBE, IN ORDER TO PROMOTE THE LIBERAL AND PRACTICAL EDUCATION OF THE INDUSTRIAL CLASSES IN THE SEVERAL PURSUITS AND PROFESSIONS IN LIFE." END OF QUOTE.

I AM OF THE OPINION THAT NEXT TO THE ESTABLISHMENT BY OUR PIONEER FOREFATHERS OF A SYSTEM OF ELEMENTARY EDUCATION BASED ON THE CONCEPT THAT EVERY YOUNGSTER SHOULD HAVE THE OPPORTUNITY TO LEARN TO READ AND WRITE, THE ESTABLISHMENT OF OUR NATION'S LAND-GRANT UNIVERSITY SYSTEM WAS THE MOST IMPORTANT PIECE OF LEGISLATION FOR BENEFIT OF EDUCATION EVER PASSED IN THIS OR ANY OTHER COUNTRY ON THE FACE OF THE EARTH!

THE MORRILL ACT OF 1862, WHICH IS CALLED THE LAND-GRANT ACT, AUTHORIZED FOR THE FIRST TIME AN EDUCATIONAL SYSTEM WHICH EVENTUALLY WOULD MAKE IT POSSIBLE FOR THAT 60% OF OUR NATION'S PEOPLE WHO

THEN LIVED ON THE LAND (MOST OF THEM BARELY SCRATCHING OUT AN EXISTENCE) TO PULL THEMSELVES UP BY THEIR OWN BOOTSTRAPS THROUGH THE MIRACLE WHICH ONLY EDUCATION CAN PROVIDE TO HUMAN BEINGS. THERE IS SUBSTANTIAL EVIDENCE THAT PROVIDING AN INSTITUTION OF HIGHER EDUCATION IN EACH STATE FOR THE PURPOSE OF TEACHING THE ART AND SCIENCE OF AGRICULTURE HAS MADE IT POSSIBLE TO REDUCE THE NUMBER OF PEOPLE ENGAGED IN PRODUCTION AGRICULTURE IN THIS COUNTRY FROM 60% IN 1862 DOWN TO JUST 3% IN 1982. THAT 3% OF OUR CITIZENS PRESENTLY ENGAGED IN AGRICULTURAL PRODUCTION IS NOW PRODUCING ALL OF THE FOOD AND FIBER NEEDED FOR THE OTHER 97% OF US. BEYOND THAT, OUR U.S. AGRICULTURE IS SO PRODUCTIVE THAT WE CAN EXPORT THE CROPS PRODUCED ON ONE OUT OF EVERY 3 ACRES OF LAND UNDER CULTIVATION IN THIS NATION. THIS MIRACLE OF AGRICULTURAL PRODUCTION HAS OCCURRED BECAUSE OUR FOREBEARS WERE SMART ENOUGH (OR LUCKY ENOUGH) BACK THERE IN 1862, TO CREATE THE LAND-GRANT UNIVERSITIES WHICH, IN TURN, HAVE LITERALLY RESHAPED THE DESTINY OF AMERICA.

BUT SOMETHING MORE THAN THE LAND-GRANT ACT OF 1862 WAS NEEDED! AMERICA'S AGRICULTURAL SUPREMACY NEVER WOULD HAVE BEEN ACHIEVED HAD NOT THE HATCH ACT BEEN PASSED BY THE U.S. CONGRESS IN 1887. IT WAS IN THAT YEAR THAT THE FEDERAL GOVERNMENT DECIDED TO PROVIDE MODEST FUNDING FOR THE FLEDGLING AGRICULTURAL EXPERIMENT

STATIONS WHICH, AT THAT TIME, HAD BEEN ESTABLISHED IN 13 OF THE STATES, FROM CONNECTICUT ON THE EAST TO CALIFORNIA ON THE WEST. IT WAS THIS NEW INVENTION, THE STATE AGRICULTURAL EXPERIMENT STATION, WHICH PROVIDED THE MUCH-NEEDED INSTITUTIONAL FRAMEWORK FOR GENERATING NEW KNOWLEDGE IN THE EVOLVING SUBJECT MATTER AREAS OF AGRICULTURE, HOME ECONOMICS, AND NATURAL RESOURCES.

AT THE TURN OF THE CENTURY, OUR LAND-GRANT UNIVERSITY LEADERS WERE BECOMING KEENLY AWARE OF THE FACT THAT THE CITIZENS OF OUR NATION WERE NOT BENEFITTING AS THEY SHOULD FROM THE NEW KNOWLEDGE BEING GENERATED BY THE AGRICULTURAL EXPERIMENT STATIONS. THE MISSING ELEMENT WAS A SYSTEM WHICH WOULD FACILITATE THE TRANSFER OF NEW KNOWLEDGE FROM THE UNIVERSITY AND THE EXPERIMENT STATION TO ALL OF THE CITIZENS WHO HAD NEED FOR IT. IT WAS TO MEET THAT CHALLENGE THAT IN 1902, THE OHIO STATE UNIVERSITY APPOINTED ITS FIRST SUPERINTENDENT OF EXTENSION, AND THAT SOON AFTER, COLLEGES OF AGRICULTURE ALL ACROSS THE COUNTRY BEGAN EXPERIMENTING WITH WAYS AND MEANS OF DISSEMINATING THE NEW KNOWLEDGE WHICH WAS BEING GENERATED BY THE STATE AGRICULTURAL EXPERIMENT STATIONS. IT WAS NOT UNTIL 1914, HOWEVER, THAT THE FEDERAL CONGRESS PASSED THE SMITH-LEVER ACT, WHICH AUTHORIZED FISCAL SUPPORT FOR A COOPERATIVE EXTENSION SERVICE TO BE ESTABLISHED IN EACH OF THE STATES OF THE UNITED STATES. AT THAT POINT IN TIME THE UNITED STATES OF AMERICA

FOUND ITSELF ENDOWED WITH A NEW KIND OF INSTITUTION--AN INSTITUTION THAT THE WORLD HAD NEVER EXPERIENCED PREVIOUS TO THAT TIME. THE UNITED STATES HAD PUT IN PLACE A TRINITY OF EFFORTS BEST DESCRIBED BY THE TERMS RESIDENT INSTRUCTION, RESEARCH AND EXTENSION. THAT TRINITY HAS PROVIDED THE MEANS AND MECHANISMS FOR GENERATING NEW KNOWLEDGE THROUGH RESEARCH, TRANSMITTING THAT NEW KNOWLEDGE THROUGH THE CLASSROOM TO ONCOMING GENERATIONS, AND MAKING THAT NEW KNOWLEDGE AVAILABLE TO ALL THE PEOPLE (IN EACH OF THE STATES OF OUR NATION) SO THAT THEY MIGHT ADOPT AND PROFIT FROM UTILIZING THE LATEST AND BEST INFORMATION AVAILABLE ON AGRICULTURE, HOME ECONOMICS AND NATURAL RESOURCES, AS WELL AS ON MANY OTHER DISCIPLINES EMBODIED IN TODAY'S LAND-GRANT UNIVERSITIES.

IT IS THIS SYSTEM OF RESIDENT INSTRUCTION, RESEARCH AND EXTENSION WHICH HAS MADE IT POSSIBLE FOR U.S. CITIZENS TO HAVE FOOD AND FIBER IN ABUNDANCE, EVEN AS FEWER AND FEWER CITIZENS ARE REQUIRED TO PRODUCE THE FOOD, FIBER, FOREST PRODUCTS, ORNAMENTALS, TURFGRASS, FLORICULTURE PRODUCTS, AND MANY OF THE OTHER AMENITIES OF LIFE WHICH WE NOW TAKE FOR GRANTED. IT IS THAT SAME SYSTEM WHICH HAS LEAD TO NEW CONCEPTS IN SOIL AND WATER CONSERVATION, AND TO MORE PROFITABLE FARM MANAGEMENT, AS WELL AS TO IMPROVED LEVELS OF LIVING IN OUR HOMES BY VIRTUE OF HAVING GREATER KNOWLEDGE OF FOOD PROCESSING, FOOD PRESERVATION, AND THE NUTRITIONAL NEEDS

OF OUR CITIZENS. IT IS OUR ABUNDANCE OF NUTRITIOUS FOODSTUFFS, COUPLED WITH EVER-INCREASING KNOWLEDGE OF HUMAN NUTRITION AND OF FOOD PREPARATION AND PRESERVATION WHICH HAS TEAMED UP WITH THE MEDICAL SCIENCES TO PERMIT THE AVERAGE LIFE EXPECTANCY OF OUR U.S. CITIZENS TO INCREASE BY 26 YEARS FROM 1900 TO 1977. AVERAGE LIFE EXPECTANCY WAS ONLY 47 YEARS IN 1900. BY 1977 IT HAD INCREASED TO 73 YEARS.

THERE CAN BE NO QUESTION BUT WHAT OUR NATION'S LAND-GRANT UNIVERSITIES HAVE HAD TREMENDOUS IMPACT ON EACH OF US AS INDIVIDUALS, AND UPON ALL OF OUR FELLOW CITIZENS IN TERMS OF: 1) IMPROVED LEVELS OF LIVING IN OUR HOMES; 2) ECONOMIC DEVELOPMENT IN OUR COMMUNITIES; 3) QUALITATIVE IMPROVEMENT OF OUR SOCIAL INSTITUTIONS; AND 4) ENHANCEMENT OF THE WORLD'S CAPABILITY TO FEED ITSELF IN THE DECADES AHEAD.

I AM KEENLY AWARE OF THE FACT THAT OUR ECONOMY IN THIS COUNTRY IS INFLUENCED BY A GREAT MANY FACTORS NOT THE LEAST OF WHICH ARE THE ABUNDANT NATURAL RESOURCES WITH WHICH WE HAVE BEEN BLESSED. BUT NATURAL RESOURCES WITHOUT RESEARCH AND EDUCATION ARE OF MARGINAL VALUE. IT IS A FACT THAT WHEN COLUMBUS DISCOVERED AMERICA THE NATURAL RESOURCES OF THE NORTH AMERICAN CONTINENT WERE TREMENDOUSLY GREATER THAN THEY ARE AT THE PRESENT TIME.

MUCH OF THE LAND WAS COVERED BY FORESTS OF ALMOST INESTIMABLE VALUE. NO OIL, COAL OR GAS HAD BEEN EXTRACTED. YET MOST OF THE NATURAL RESOURCES WHICH SUSTAIN US TODAY WERE OF ALMOST NO USE TO THE 370,000 AMERICAN INDIANS WHO THEN LIVED ON THE NORTH AMERICAN CONTINENT. THE SKETCHY HISTORY OF THAT ERA TELLS US THAT THOSE 370,000 AMERICAN INDIANS LIVED AT THE RAGGED EDGE OF STARVATION! TODAY, 230 MILLION AMERICAN CITIZENS ARE SUPPORTED BY SUBSTANTIALLY LESS ABUNDANT NATURAL RESOURCES YET THOSE NATURAL RESOURCES WHICH REMAIN ARE PROVIDING US WITH THE HIGHEST STANDARD OF LIVING ON THE FACE OF THE EARTH. THIS FACT IN ITSELF PROVIDES DRAMATIC EVIDENCE OF THE IMPACT OF RESEARCH AND EDUCATION, AND SPEAKS ELOQUENTLY OF THE CONTRIBUTION OF OUR NATION'S LAND-GRANT UNIVERSITIES.

I AM TREMENDOUSLY EXCITED ABOUT THE CHALLENGE FACING OUR NATION AS WE ARE CONFRONTED WITH THE PROSPECT OF INCREASING OUR AGRICULTURAL EXPORTS BY 3% EACH YEAR INTO THE FORESEEABLE FUTURE. IF WE MEET THAT CHALLENGE WE WILL HAVE OPPORTUNITY TO DOUBLE OUR EXPORTS OF AGRICULTURAL PRODUCTS BY THE YEAR 2006. CLEARLY, THE LAND-GRANT UNIVERSITY PATTERN OF RESIDENT INSTRUCTION, RESEARCH AND EXTENSION EDUCATION HAS BEEN EFFECTIVE. IT HAS PRODUCED AN ABUNDANCE OF FOOD FOR OUR CITIZENS, AND HAS PLAYED A MAJOR ROLE IN HELPING THE UNITED STATES TO ACHIEVE THE

HIGHEST STANDARD OF LIVING IN THE HISTORY OF MANKIND. IT HAS ENABLED US TO EXPORT ONE ACRE OUT OF EVERY 3 ACRES OF OUR PRODUCTION. IN THE FISCAL YEAR WHICH ENDED ON SEPTEMBER 30, 1981, AGRICULTURAL EXPORTS CONSTITUTED 28% OF ALL EXPORTS FROM THE UNITED STATES.

UNFORTUNATELY, THERE ARE THOSE WHO WOULD HAVE US BELIEVE THAT TO ACHIEVE OUR PRESENT LEVEL OF EXPORTS WE ARE MINING THE SOIL--THAT WHAT WE ARE DOING IS DETRIMENTAL TO THE BEST INTERESTS OF OUR NATION. SOME OF THE DETRACTORS OF OUR AGRICULTURAL INDUSTRY TRY TO TELL US THAT WE OUGHT TO GO BACK TO THE USE OF HORSE-DRAWN EQUIPMENT AND TO UTILIZING PRIMARILY HUMAN LABOR FOR THE PRODUCTION OF FOOD IN THIS COUNTRY AND WORLDWIDE. WHAT THEY FAIL TO REALIZE IS THAT IF WE FOLLOWED THEIR MISGUIDED ADVICE WE WOULD NEED, NOT THE 3.5 MILLION PEOPLE THAT WE NOW HAVE WORKING ON OUR FARMS, BUT 31 MILLION PEOPLE WORKING ALONGSIDE 61 MILLION HORSES AND MULES IN ORDER TO PRODUCE THE CROPS, AS WELL AS THE LIVESTOCK AND POULTRY PRODUCTS, THAT WE PRESENTLY PRODUCE IN THIS COUNTRY. A CRITICAL ITEM WHICH THOSE DETRACTORS CONVENIENTLY OVERLOOK IS THE REALITY OF WHAT WOULD HAPPEN TO THE NUTRITIONAL STATUS OF MILLIONS OF PEOPLE IN THIS COUNTRY IF WE WERE TO ELIMINATE MEAT, MILK AND POULTRY PRODUCTS FROM THEIR DIETS.

THE 61 MILLION WORK ANIMALS NEEDED TO REPLACE MECHANICAL POWER WOULD REQUIRE AS MUCH LAND FOR HAY AND GRAIN TO FEED

THOSE WORK ANIMALS AS IS PRESENTLY BEING CULTIVATED TO PRODUCE THE OILSEEDS, AS WELL AS FOOD AND FEED GRAINS, THAT WE HAVE AVAILABLE FOR EXPORT. AS A RESULT, OUR AGRICULTURAL EXPORTS, VALUED AT NEARLY \$45 BILLION LAST YEAR, WOULD BE LARGELY ELIMINATED. AN EVEN MORE SERIOUS CONSEQUENCE WOULD INVOLVE MALNUTRITION AND STARVATION FOR MILLIONS OF HUMAN BEINGS OVERSEAS WHO ARE DEPENDENT ON OUR AGRICULTURAL EXPORTS.

IT IS TERRIBLY DIFFICULT TO GET ACROSS, EVEN TO OTHERWISE WELL-EDUCATED PEOPLE, THE EVIDENCE THAT ON A WORLD-WIDE BASIS, WE ARE NOT ABOUT TO RUN OUT OF THE NATURAL RESOURCES NEEDED TO PROVIDE A HIGH STANDARD OF LIVING FOR ALL HUMAN BEINGS ON PLANET EARTH.

IN HIS BOOK, THE ULTIMATE RESOURCE, DR. JULIAN L. SIMON³ HAS DOCUMENTED THE AVAILABILITY OF MINERAL DEPOSITS IN TERMS OF ULTIMATE RECOVERABLE RESOURCES. HE HAS SHOWN THAT THE CONCEPT OF "PROVEN RESERVES" IS AT BEST A RIDICULOUSLY PESSIMISTIC BASIS FOR FORECASTING THE SUPPLY OF THOSE RESOURCES WHICH WILL BE AVAILABLE FOR FUTURE CONSUMPTION. THE DIFFICULTY STEMS FROM TECHNOLOGICAL FORECASTING WHICH TENDS TO DESCRIBE THE SUPPLY OF A RESOURCE WHICH IS AVAILABLE AT CURRENT PRICES AND WITH CURRENT TECHNOLOGY. THIS GETS US INTO DIFFICULTY BECAUSE THE MOST PROMISING RESOURCES WILL ALWAYS BE USED FIRST AND THE TREND LINES WILL SHOW RAPID EXHAUSTION OF

"RESERVES" EVEN THOUGH THERE MAY NOT BE ANY SCARCITY FOR HUNDREDS OF YEARS INTO THE FUTURE. DR. SIMON HAS STATED, AND I QUOTE: "THE TECHNOLOGICAL INVENTORY OF THE EARTH'S 'CONTENTS' IS AT PRESENT QUITE INCOMPLETE, FOR THE VERY GOOD REASON THAT IT HAS NEVER BEEN WORTHWHILE TO GO TO THE TROUBLE OF MAKING DETAILED SURVEYS. WHY SHOULD YOU COUNT THE STONES IN MONTANA WHEN YOU HAVE ENOUGH TO SERVE AS PAPERWEIGHTS RIGHT IN YOUR OWN BACK YARD? THIS POINT WAS MADE SHARPLY BY THE WORLD BANK'S REPORT ON THE LIMITS TO GROWTH:

"WE DO NOT KNOW THE TRUE EXTENT OF THE RESOURCES THAT EXIST IN AND CAN ULTIMATELY BE RECOVERED FROM THE EARTH. NOR WILL WE KNOW IN THE NEXT TWO YEARS OR TEN YEARS. THE REASON WHY WE DO NOT KNOW THE ABSOLUTE LIMITS OF THE RESOURCES WE HAVE IS SIMPLE AND DOES NOT EVEN REQUIRE RECOURSE TO ELABORATE ARGUMENTS ABOUT THE WONDERS OF TECHNOLOGY. WE DO NOT KNOW BECAUSE NO ONE HAS AS YET FOUND IT NECESSARY TO KNOW AND THEREFORE WENT ABOUT TAKING AN ACCURATE INVENTORY." ⁴

QUOTING AGAIN FROM DR. SIMON: "... MANY OF THE BEST-QUALIFIED FORECASTERS REPORT ENORMOUS RESOURCE AVAILABILITIES--IN CONTRAST TO THE SCARE STORIES THAT DOMINATE THE DAILY NEWSPAPERS. THE

CENTRAL DIFFICULTY AGAIN IS, WHICH EXPERT WOULD YOU CHOOSE TO BELIEVE? IF YOU WISH, YOU CAN CERTAINLY FIND SOMEONE WITH ALL THE PROPER ACADEMIC QUALIFICATIONS WHO WILL TRY TO GIVE YOU AS GOOD A SCARE FOR YOUR MONEY AS A HORROR MOVIE. FOR EXAMPLE, THE GEOLOGIST, PRESTON CLOUD, HAS WRITTEN THAT 'FOOD AND RAW MATERIALS PLACE ULTIMATE LIMITS ON THE SIZE OF POPULATIONS . . . SUCH LIMITS WILL BE REACHED WITHIN THE NEXT 30 TO 100 YEARS';⁵ AND, OF COURSE, NOT TOO MANY YEARS AGO THE BEST-SELLING BOOK BY PAUL AND WILLIAM PADDOCK, FAMINE--1975!, TOLD IT ALL IN THE TITLE. AFTER THIS CAME SIMILAR FORECASTS FROM PAUL EHRLICH AND OTHERS . . ." END OF QUOTE.

AT THE OPPOSITE END OF THE SPECTRUM IS THE MORE REALISTIC "ASSESSMENT OF THE RAW MATERIALS SITUATION BY HERMAN KAHN AND THE HUDSON INSTITUTE. EXAMINING THE EVIDENCE ON THE 12 PRINCIPAL METALS THAT ACCOUNT FOR 99.9% OF THE WORLD AND U.S. METAL CONSUMPTION, THEY CLASSIFY THEM INTO ONLY THE TWO CATEGORIES, 'CLEARLY INEXHAUSTIBLE' AND 'PROBABLY INEXHAUSTIBLE,' FINDING NONE THAT ARE LIKELY TO BE EXHAUSTED IN ANY FORESEEABLE FUTURE THAT IS RELEVANT TO CONTEMPORARY DECISIONS. THEY CONCLUDE THAT '95% OF THE WORLD DEMAND IS FOR FIVE METALS WHICH ARE NOT CONSIDERED EXHAUSTIBLE.'"⁶

"AN EARLIER FORECAST BY ONE OF AMERICA'S GREATEST GEOLOGISTS, KIRTLEY MATHER, WAS SIMILAR: 'SUMMING IT ALL UP, FOR NEARLY ALL

OF THE IMPORTANT NON-RENEWABLE RESOURCES, THE KNOWN OR CONFIDENTLY EXPECTED WORLD STORES ARE THOUSANDS OF TIMES AS GREAT AS THE ANNUAL WORLD CONSUMPTION. FOR THE FEW WHICH LIKE PETROLEUM ARE AVAILABLE IN RELATIVELY SMALL QUANTITIES, SUBSTITUTES ARE KNOWN OR POTENTIAL SOURCES OF ALTERNATIVE SUPPLY ARE AT HAND IN QUANTITIES ADEQUATE TO MEET OUR NEEDS FOR MANY THOUSANDS OF YEARS. THERE IS NO PROSPECT OF THE IMMINENT EXHAUSTION OF ANY OF THE TRULY ESSENTIAL RAW MATERIALS, AS FAR AS THE WORLD AS A WHOLE IS CONCERNED. MOTHER EARTH'S STOREHOUSE IS FAR MORE RICHLY STOCKED WITH GOODS THAN IS ORDINARILY INFERRED."⁷

DR. SIMON HAS SUMMARIZED THE DATA FROM A NUMBER OF SOURCES AND HAS CONCLUDED, AND AGAIN I QUOTE: "THE POTENTIAL RESERVES FOR ALL OF THE IMPORTANT MINERALS ARE SUFFICIENT FOR MANY MANY LIFETIMES, ON THE BASIS OF ALMOST ANY ASSUMPTION ABOUT WHETHER RESOURCES ARE 'REALLY' FINITE OR NOT. THE POINT IS BROUGHT OUT BY THIS JOKE:

A PROFESSOR GIVING A LECTURE DECLARES THAT THE WORLD WILL PERISH SUDDENLY AND CERTAINLY IN SEVEN BILLION YEARS' TIME. ONE OF THE AUDIENCE BECOMES VERY AGITATED, ASKS THE PROFESSOR TO REPEAT WHAT HE SAID, AND THEN, COMPLETELY REASSURED, HEAVES A SIGH OF RELIEF: PHEW! I THOUGHT HE SAID SEVEN MILLION YEARS!⁸

AS A WISE GEOLOGIST PUTS IT, "RESERVES ARE BUT A SMALL PART OF THE RESOURCES OF ANY GIVEN COMMODITY. RESERVES AND RESOURCES ARE PART OF A DYNAMIC SYSTEM AND THEY CANNOT BE INVENTORIED LIKE CANS OF TOMATOES ON A GROCER'S SHELF. NEW SCIENTIFIC DISCOVERIES, NEW TECHNOLOGY, AND NEW COMMERCIAL DEMANDS OR RESTRICTIONS ARE CONSTANTLY AFFECTING AMOUNTS OF RESERVES AND RESOURCES. RESERVES AND RESOURCES DO NOT EXIST UNTIL COMMERCIAL DEMAND PUTS A VALUE ON A MATERIAL IN THE MARKET." ⁹

QUOTING AGAIN FROM DR. SIMON: "TO DESCRIBE THOSE WHO BELIEVE THAT THE NATURAL RESOURCES ARE AVAILABLE IN PRACTICALLY LIMITLESS ABUNDANCE, SOMEONE HAS COINED THE PHRASE 'CORNUCOPIANS,' TO CONTRAST WITH 'DOOMSDAYERS.' BUT PLEASE NOTICE: THE SCHOOL OF THOUGHT THAT I REPRESENT HERE IS NOT CORNUCOPIAN. I DO NOT BELIEVE THAT NATURE IS LIMITLESSLY BOUNTIFUL. I BELIEVE INSTEAD THAT THE POSSIBILITIES IN THE WORLD ARE SUFFICIENTLY GREAT SO THAT WITH THE PRESENT STATE OF KNOWLEDGE, AND WITH THE ADDITIONAL KNOWLEDGE THAT THE HUMAN IMAGINATION AND HUMAN ENTERPRISE WILL DEVELOP IN THE FUTURE, WE AND OUR DESCENDANTS CAN MANIPULATE THE ELEMENTS IN SUCH A FASHION THAT WE CAN HAVE ALL THE MINERAL RAW MATERIALS THAT WE NEED AND DESIRE AT PRICES EVER SMALLER RELATIVE TO OTHER PRICES AND TO OUR TOTAL INCOMES. IN SHORT, OUR CORNUCOPIA IS

THE HUMAN MIND AND HEART, AND NOT A SANTA CLAUS NATURAL ENVIRONMENT. SO HAS IT BEEN IN THE PAST, AND THEREFORE SO IS IT LIKELY TO BE IN THE FUTURE." END OF QUOTE.

SO I CLOSE MY REMARKS ON A STRONG NOTE OF OPTIMISM. I BELIEVE IT IS TREMENDOUSLY SIGNIFICANT FOR THE MEMBERS OF THIS GRADUATING CLASS AND FOR EVERY OTHER CITIZEN TO UNDERSTAND AND APPRECIATE THAT RESEARCH AND EDUCATION ARE "THE KEYS TO THE KINGDOM." WE MUST UNDERSTAND AND APPRECIATE, ALSO, THAT THE OHIO STATE UNIVERSITY IS UNIQUE. IT IS UNIQUE IN TERMS OF THE COURSES AND CURRICULA WHICH ARE OFFERED. IT IS DIFFERENT FROM ANY OTHER INSTITUTION IN THE STATE OF OHIO IN TERMS OF THE BLEND OF THEORETICAL AND PRACTICAL KNOWLEDGE WHICH IS TAUGHT, AS WELL AS IN TERMS OF THE DISCIPLINES AND SUB-DISCIPLINES WHICH COMPRISE ITS OFFERINGS. BUT MOST OF ALL, OHIO STATE IS UNIQUE IN TERMS OF ITS ORIENTATION--AN ORIENTATION OF RESEARCH TO GENERATE NEW KNOWLEDGE, AND OF BOTH RESIDENT AND OFF-CAMPUS EDUCATION TO DISSEMINATE THAT NEW KNOWLEDGE TO ALL WHO SEEK ENLIGHTENMENT.

THE OHIO STATE UNIVERSITY IS YOUR UNIVERSITY. IT RANKS AMONG THE FINEST RESEARCH AND EDUCATIONAL INSTITUTIONS IN THE ENTIRE WORLD. YOU WHO ARE GRADUATING HERE TODAY WILL BUILD UPON THE PROUD HERITAGE WHICH HAS BEEN CREATED BY 303,697 GRADUATES WHO HAVE PRECEDED YOU. EACH OF YOU IS EXPECTED TO EXCEL! THOSE

WHOM YOU LOVE, AND WHO LOVE YOU, HAVE GIVEN MUCH SO THAT YOU MIGHT SIT IN THESE STANDS TODAY AS A GRADUATE OF THE OHIO STATE UNIVERSITY. CLEARLY, YOU ARE NOT THE SAME PERSON THAT YOU WERE WHEN YOU BEGAN YOUR STUDIES FOR THE DEGREE WHICH YOU WILL RECEIVE TODAY. YOUR UNDERSTANDING OF THE WORLD AROUND YOU AND OF THE PEOPLE IN IT WILL NEVER AGAIN BE AS IT WAS WHEN YOU FIRST ENROLLED AT OHIO STATE.

AS DR. SIMON HAS STATED, AND AGAIN I QUOTE: "THE MAIN FUEL TO SPEED OUR PROGRESS IS OUR STOCK OF KNOWLEDGE, AND THE BRAKE IS OUR LACK OF IMAGINATION. THE ULTIMATE RESOURCE IS PEOPLE-- SKILLED, SPIRITED, AND HOPEFUL PEOPLE WHO WILL EXERT THEIR WILLS AND IMAGINATIONS FOR THEIR OWN BENEFIT, AND SO INEVITABLY FOR THE BENEFIT OF US ALL." END OF QUOTE.

MY WISH FOR EACH AND EVERY ONE OF YOU WHO ARE GRADUATING TODAY IS SIMPLY THIS FAMILIAR QUOTATION:

MAY THE ROAD RISE UP TO MEET YOU,
MAY THE WIND BE ALWAYS AT YOUR BACK,
MAY THE SUN SHINE WARM UPON YOUR FACE,
THE RAINS FALL SOFT UPON YOUR FIELDS.
AND UNTIL WE MEET AGAIN,
MAY GOD HOLD YOU IN THE PALM OF HIS HAND. ¹⁰

THANK YOU.

FOOTNOTES

¹ Paul Dickson, "The Official Rules," used by permission of Delacorte Press, New York, New York, 1978, as quoted in "Any Fool Can Make a Rule," Reader's Digest, March, 1979, pp. 51-60.

² John Naisbitt, "Reading the Trends of the 80s," unpublished speech delivered to the Federation for Community Planning, Cleveland, Ohio, March 4, 1981.

³ Julian L. Simon, The Ultimate Resource, Princeton University Press, Princeton, New Jersey, 1981.

⁴ World Bank, "Report on the Limits to Growth," 1972, p. 37, as quoted by James A. Weber, Grow or Die!, Arlington House, New Rochelle, New York, 1977, p. 62.

⁵ Preston Cloud, as quoted by Weber, 1977, *ibid.*

⁶ Herman Kahn et al., The Next Two Hundred Years: A Scenario for America and the World. Morrow. New York, 1976, p. 101.

⁷ Kirtley Mather, Enough and to Spare, 2nd ed., Harper, New York, 1944, p. 29.

⁸ Alfred Sauvy, translated by A. Maguire, Zero Growth, Praeger, New York, 1976, p. 251.

⁹ Donald Brobst, Fundamental Concepts for the Analysis of Resource Availability, in Vincent Kerry Smith, Ed., 1979, p. 115.

¹⁰ An Irish Blessing, anonymous.