

NESTEL

no. 15

Agricultural research as a component of foreign aid; address
to the

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A. B. C.

GUEST OF HONOUR

BARRY NESTEL

THE A.B.C.'S GUEST OF HONOUR, THIS WEEK, IS BARRY NESTEL -
ASSOCIATE DIRECTOR OF THE AGRICULTURE, FOOD AND NUTRITION SCIENCES
PROGRAMME OF THE CANADIAN INTERNATIONAL DEVELOPMENT RESEARCH CENTRE.

HE GRADUATED FROM LONDON UNIVERSITY IN VETERINARY SCIENCE AND
LATER OBTAINED A DOCTORATE IN AGRICULTURAL ECONOMICS FROM THE SAME
UNIVERSITY.

HIS CAREER OF TWENTY YEARS IN TROPICAL AGRICULTURE STARTED WITH
NINE YEARS WITH THE RESEARCH DEPARTMENT OF THE JAMAICAN SUGAR INDUSTRY
WHERE HE WAS CONCERNED WITH LIVESTOCK AND GRASSLAND RESEARCH.

HE LEFT JAMAICA TO JOIN F.A.O. WORKING, INITIALLY, IN SOUTH
AMERICA AND, LATER, IN THE ROME HEADQUARTERS WHERE HE WAS INVOLVED IN
LIVESTOCK DEVELOPMENT PLANNING.

SINCE 1970, HE HAS BEEN WITH THE INTERNATIONAL DEVELOPMENT
RESEARCH CENTRE, A CANADIAN CROWN CORPORATION RESPONSIBLE FOR THE
RESEARCH ASPECTS OF THE CANADIAN FOREIGN AID PROGRAM.

DURING THE PAST DECADE, DR. NESTEL HAS VISITED AGRICULTURAL
DEVELOPMENT PROJECTS COVERING A WIDE RANGE OF ACTIVITIES IN OVER
SEVENTY DEVELOPING COUNTRIES. HIS TALK TONIGHT DEALS WITH AGRICULTURAL
RESEARCH AS A COMPONENT OF FOREIGN AID.

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THERE ARE A NUMBER OF WELL KNOWN ARGUMENTS BOTH FOR AND AGAINST FOREIGN AID PROGRAMMES. NOTWITHSTANDING THESE, FOREIGN AID TODAY IS BIG BUSINESS, EMPLOYS A LOT OF PEOPLE AND IS ASSOCIATED WITH A TOTAL NET FLOW OF FUNDS, FROM DEVELOPED TO DEVELOPING COUNTRIES, OF THE ORDER OF 15 TO 20 BILLION AUSTRALIAN DOLLARS A YEAR.

THE ECONOMIES OF MANY OF THE COUNTRIES TO WHICH THIS AID IS DIRECTED ARE PRIMARILY AGRICULTURAL - IN SOME CASES, AGRICULTURE MAKES UP OVER HALF OF THE GROSS NATIONAL PRODUCT AND IS THE PRIMARY SOURCE OF EMPLOYMENT. SUCH COUNTRIES ARE UNLIKELY TO GENERATE SUFFICIENT LOCAL FUNDS TO ACHIEVE MEANINGFUL DEVELOPMENT UNTIL THEY CAN ESTABLISH A SATISFACTORY GROWTH RATE IN THEIR DOMESTIC AGRICULTURE.

UNFORTUNATELY, THE RECORD OF THE LAST TEN YEARS INDICATES THAT, IN SPITE OF STRENUOUS EFFORTS TO RAISE THE VERY LOW LEVELS OF AGRICULTURAL PRODUCTIVITY IN THE THIRD WORLD, MANY COUNTRIES HAVE NOT SUCCEEDED IN INCREASING THEIR PER CAPITA PROTEIN INTAKES AND SOME HAVE ONLY BEEN ABLE TO MAINTAIN THEIR CALORIE REQUIREMENTS BY INCREASING THEIR IMPORT OF CEREALS.

THE SHORTAGE OF FOREIGN EXCHANGE FOR IMPORTING FOOD IN THESE COUNTRIES HAS BEEN ACCELERATED BY THE RECENT OIL CRISIS AND IT APPEARS THAT A CONTINUATION OF THE PAST TREND IN SLOW GROWTH OF AGRICULTURAL PRODUCTION IN THE DEVELOPING WORLD COULD LEAD TO MAJOR FAMINES IN THE 1980'S.

IN AN EFFORT TO COUNTERACT THIS, THE UNITED NATIONS HAVE RECENTLY CALLED UPON DONOR COUNTRIES TO SUPPLY FURTHER LARGE SUMS OF MONEY FOR THE DEVELOPMENT OF FOOD PRODUCTION IN THE THIRD WORLD, AND THE WORLD BANK HAS SUBSTANTIALLY INCREASED ITS LENDING FOR RURAL DEVELOPMENT.

IN VIEW OF THE QUESTIONABLE RESULTS ACHIEVED BY MANY AGRICULTURAL DEVELOPMENT PROGRAMMES IN THE LAST TWENTY YEARS, IT MAY BE TIMELY TO ASK WHETHER ALL THIS EXTRA FUNDING IS LIKELY TO PRODUCE A SIGNIFICANT IMPACT.

IN THE LAST FEW YEARS, SOME THOUGHTFUL EFFORTS HAVE BEEN MADE TO TRY TO EVALUATE WHY SO MANY PROGRAMMES IN AGRICULTURAL DEVELOPMENT HAVE FAILED - IT APPEARS THAT MANY AID AGENCIES AND THEIR STAFF HAVE TAKEN A LONG TIME TO RECOGNISE THAT RURAL PROBLEMS NEED TO BE PROPERLY UNDERSTOOD BEFORE THEY CAN BE RESOLVED. THIS OBSERVATION IS OF PARTICULAR RELEVANCE WHEN CULTURAL CONSIDERATIONS INFLUENCE THE ATTITUDE TO PROBLEM-SOLVING.

IN MANY POOR RURAL SOCIETIES THE PARAMOUNT OBJECTIVE OF THE INDIVIDUAL FARMER IS SECURITY, OR EVEN SURVIVAL, AND THE PROFIT MOTIVE, WHICH PLAYS SUCH A LARGE ROLE IN WESTERN SOCIETY, IS OF MUCH MORE LIMITED IMPORTANCE. A TYPICAL ANDEAN SMALL HOLDER WHO OWNS 2 HECTARES OF LAND WITH AN INSECURE LAND TITLE, A CASH INCOME OF \$100 A YEAR AFTER FEEDING HIS FAMILY, AND WHO HAS TO PAY 60 OR 80 PERCENT PER ANNUM INTEREST ON BORROWED MONEY, IS UNDERSTANDABLY RELUCTANT TO SWITCH FROM A TRADITIONAL SEED WHICH GIVES A LOW BUT RELIABLE YIELD WITHOUT FERTILIZER OR INSECTICIDE, TO A HIGH YIELDING HYBRID SEED WHICH WILL PROBABLY INCREASE HIS INCOME BUT FOR WHICH HE HAS TO GO INTO DEBT IN ORDER TO PURCHASE THE HYBRID SEED AND THE FERTILIZER AND INSECTICIDE WHICH IT REQUIRES.

BECAUSE OF THIS DIFFERENT RESOURCE SITUATION, THE PEASANT FARMER OF THE THIRD WORLD IS OFTEN NOT HELPED BY, OR EVEN INTERESTED IN, A PROGRAM WHICH SEEKS TO SHOW HIM WHAT NEW TECHNOLOGY TO ADOPT. HIS NEED IS MORE LIKELY TO BE MET BY THE PROGRAM WHICH SEEKS TO ADAPT WESTERN TECHNOLOGY TO HIS LOCAL CONDITIONS AND RESOURCES.

SINCE OVER 80 PERCENT OF THE FARMERS OF THE THIRD WORLD ARE SMALL PEASANT FARMERS, THIS MEANS THAT IN ORDER TO INFLUENCE AGRICULTURAL PRODUCTIVITY IN THEIR COUNTRIES, IT IS FIRST NECESSARY TO UNDERSTAND THE SYSTEM OF PEASANT FARMING, ITS CULTURAL BACKGROUND AND ITS CONSTRAINTS.

STRATEGIES FOR DEVELOPING NEW TECHNOLOGY ADAPTED TO PEASANT NEEDS CAN THEN BE FORMULATED. SUCH STRATEGIES CANNOT BE PREPARED IN EITHER DONOR OR RECIPIENT COUNTRIES, WITHOUT FIRST CARRYING OUT FIELD RESEARCH IN CONJUNCTION WITH PEASANT FARMERS.

IN THE PAST, MOST OF THE AGRICULTURAL RESEARCH CARRIED OUT IN DEVELOPING COUNTRIES HAS BEEN RELATED TO EXPORT CROPS, MANY OF WHICH PLAY A LIMITED ROLE IN THE FOOD SUPPLY OF THE COUNTRIES IN WHICH THEY ARE PRODUCED. FOR COMMODITIES SUCH AS COCOA, COFFEE, SUGAR, BANANAS, TEA AND RUBBER, THIS EXPORT— ORIENTED RESEARCH HAS BENEFITTED BOTH SMALL FARMERS AND ESTATE AGRICULTURE, SINCE THESE COMMODITIES ARE GROWN BY BOTH GROUPS.

HOWEVER, VERY LITTLE RESEARCH HAS TAKEN PLACE ON SUBSISTENCE CROPS WHICH ARE THE MAJOR SOURCE OF BOTH FOOD AND INCOME ON SMALL FARMS IN THE TROPICS. FOR EXAMPLE, TROPICAL ROOT CROPS WHICH PROVIDE A MAJOR SOURCE OF ENERGY FOR ABOUT 500 MILLION PEOPLE IN AFRICA, ASIA AND LATIN AMERICA HAVE A TOTAL FARM-GATE VALUE OF ABOUT

3 BILLION AUSTRALIAN DOLLARS A YEAR BUT THE TOTAL ANNUAL RESEARCH INPUT FOR THESE CROPS HAS BEEN ONLY \$300,000, OR ONE TEN THOUSANDTH OF THE ANNUAL VALUE OF ROOT CROP PRODUCTION. COMPARE THIS WITH AUSTRALIA WHERE, IN ONE COUNTRY ALONE, SOMETHING OF THE ORDER OF A HUNDRED MILLION DOLLARS A YEAR IS DEVOTED TO AGRICULTURAL RESEARCH.

IN THE PAST DECADE THERE HAS BEEN A GRADUAL RECOGNITION OF THE NEED FOR ACCELERATING FOOD CROP RESEARCH IN THE TROPICS. THE SUCCESSES OF THE INTERNATIONAL RICE RESEARCH INSTITUTE IN THE PHILIPPINES, AND OF THE INTERNATIONAL CENTRE FOR RESEARCH ON WHEAT AND CORN IN MEXICO HAVE LED TO THE CREATION OF SEVEN ADDITIONAL INTERNATIONAL AGRICULTURAL RESEARCH INSTITUTES MODELLED ON THE ORIGINAL TWO AND FOCUSED PRIMARILY ON CROP AND LIVESTOCK PRODUCTION ON THE SMALL FARM. THE NINE INTERNATIONAL AGRICULTURAL RESEARCH INSTITUTES ARE CO-ORDINATED BY THE WORLD BANK WHO ADMINISTER A FUND TO WHICH 24 DONORS, INCLUDING AUSTRALIA, CONTRIBUTE.

HOWEVER, RESEARCH IN WELL STAFFED AND EQUIPPED INTERNATIONAL INSTITUTES CAN ONLY PLAY A LIMITED AND SPECIFIC ROLE IN RESOLVING WORLD HUNGER. THESE INSTITUTES CAN, AND DO, FULFIL TWO MAIN FUNCTIONS - FIRSTLY, TO CREATE NEW AND SUPERIOR GERM PLASM - THE SO CALLED 'MIRACLE' VARIETIES - AND, SECOND, TO TRAIN SCIENTISTS FROM DEVELOPING COUNTRIES IN ORDER TO IMPROVE THEIR ABILITY TO HANDLE SUPERIOR GENETIC MATERIAL.

THESE ACTIVITIES OF THE INTERNATIONAL INSTITUTES ARE ONLY TWO OF SEVERAL LINKS IN THE AGRICULTURAL DEVELOPMENT CHAIN, AND, IN THEMSELVES, WILL NOT BENEFIT PEASANT FARMERS UNTIL, AND UNLESS,

THE SCIENTISTS IN NATIONAL INSTITUTES TEST, EVALUATE AND, IF NECESSARY, MODIFY THE NEW VARIETIES SO THAT THEY MEET THE SPECIFIC NEEDS OF LOCAL FARMERS.

TO BE EFFECTIVE, THE WHOLE PROCESS NEEDS TO BE A TWO-WAY DIALOGUE SINCE NOT ONLY DO THE INTERNATIONAL CENTRES NEED TO PRODUCE THE NEW VARIETIES BUT THEY NEED TO BE FED INFORMATION ON THE SPECIFIC LOCAL SEED REQUIREMENTS OF FARMERS IN DIFFERENT ECOSYSTEMS.

AT PRESENT, THE CAPACITY OF NATIONAL RESEARCH INSTITUTES TO ACT AS INTERMEDIARIES IN THIS CHAIN IS OFTEN LIMITED, NOT SO MUCH BY PERSONNEL, SINCE MANY DEVELOPING COUNTRIES NOW POSSESS A CADRE OF TRAINED PERSONNEL, AS BY FINANCE, SINCE AGRICULTURAL RESEARCH RARELY RECEIVES HIGH PRIORITY FROM DEVELOPING COUNTRY PLANNERS AND POLICY MAKERS CONFRONTED WITH A HOST OF CONFLICTING DEMANDS FOR LIMITED FINANCIAL RESOURCES, AND ANXIOUS FOR QUICK AND SPECTACULAR RESULTS. AGRICULTURAL RESEARCH IS GENERALLY A LONG TERM PROCESS AND ALTHOUGH ECONOMIC STUDIES FROM BOTH DEVELOPED AND DEVELOPING COUNTRIES SUGGEST THAT IT CAN HAVE A VERY HIGH PAY-OFF, IT'S LONG TERM NATURE DOES NOT MAKE IT ATTRACTIVE TO POLITICAL DECISION MAKERS.

THIS IS A SITUATION WHICH, IN THE LONG-RUN, CAN ONLY BE RESOLVED BY THE DEVELOPING COUNTRIES THEMSELVES. IN THE SHORT TERM, DONOR AGENCY ACTION CAN, AND IS, ASSISTING IN THE FINANCING AND STRENGTHENING OF NATIONAL RESEARCH INSTITUTES. AN INTERESTING RECENT TREND IN THIS DIRECTION IS THE DEVELOPMENT OF TRI-PARTITE RESEARCH LINKS BETWEEN SCIENTISTS IN THE DEVELOPED COUNTRIES, THE INTERNATIONAL INSTITUTES AND DEVELOPING COUNTRY INSTITUTIONS.

WE, IN CANADA, HAVE BEEN PARTICULARLY INTERESTED IN EXPLORING THIS APPROACH - FOR EXAMPLE, THE LARGEST SORGHUM RESEARCH PROGRAMME IN THE TROPICS IS BASED AT ICRISAT (THE INTERNATIONAL CENTRE FOR RESEARCH IN THE SEMI-ARID TROPICS), LOCATED IN INDIA. THIS CENTRE RECEIVES DIRECT SUPPORT FROM CIDA (THE CANADIAN DEVELOPMENT ASSISTANCE PROGRAM) BUT IS ALSO LINKED TO SUPPORT FROM IDRC, (THE RESEARCH AGENCY WITH WHICH I AM ASSOCIATED), WITH RESPECT TO BASIC RESEARCH ON THE CROP, WHICH WE FUND IN CANADA AT THE UNIVERSITY OF SASKATOON. WE ALSO SUPPORT PROGRAMS FOR DEVELOPING NATIONAL SORGHUM RESEARCH TEAMS IN SPECIFIC AFRICAN AND ASIAN COUNTRIES. A SIMILAR THREE-WAY LINK UTILISING CANADIAN GOVERNMENT AND UNIVERSITY SCIENTISTS, INTERNATIONAL AGRICULTURAL RESEARCH CENTRES AND NATIONAL RESEARCH PROGRAMS IS UNDER WAY FOR SOME OTHER PREVIOUSLY NEGLECTED TROPICAL FOOD CROPS.

THE OVERALL CONCEPT BEHIND THIS TRI-PARTITE APPROACH IS TO OPTIMISE THE USE OF SCIENTIFIC AND PHYSICAL RESOURCES LOCATED IN THE THREE TYPES OF INSTITUTE SO THAT COLLECTIVELY THEY FOCUS ON PRACTICAL PROBLEMS OF INCREASING FOOD PRODUCTION IN THE POOREST COUNTRIES.

I HAVE SPECIFICALLY REFERRED TO THIS CANADIAN EXPERIENCE BOTH BECAUSE I AM FAMILIAR WITH IT, THROUGH MY OWN WORK, AND BECAUSE IT SEEMS TO BE AN APPROACH WHICH HAS INTERESTED A LOT OF AUSTRALIANS INVOLVED IN DEVELOPMENT ASSISTANCE.

IN MY COMMENTS SO FAR, I HAVE REFERRED ONLY TO CROP PRODUCTION, BUT IN BOTH THE HUMID AND THE DRY TROPICS, GRASSLAND AND RANGELAND COVERS A MUCH LARGER AREA THAN DOES CROPPED LAND. THE RESEARCH INPUT DIRECTED TO IMPROVING THE PRODUCTIVITY OF TROPICAL GRASSLANDS HAS BEEN EVEN MORE LIMITED THAN THAT GIVEN TO TROPICAL FOOD CROPS. IN FACT, NEARLY ALL TROPICAL GRASSLAND RESEARCH IN THE WORLD TODAY IS A DIRECT SPIN-OFF FROM AUSTRALIAN ACTIVITIES IN THIS FIELD, AND IS USUALLY BEING CARRIED OUT BY AUSTRALIAN SCIENTISTS OR THEIR TRAINEES. THE AUSTRALIAN INPUT INCLUDES SCIENTISTS FROM UNIVERSITIES, STATE GOVERNMENTS AND, PARTICULARLY, C.S.I.R.O.

I HAVE RECENTLY HAD THE OPPORTUNITY TO SEE SOME OF THE RESEARCH ON TROPICAL GRASSLANDS WHICH IS UNDERWAY IN AUSTRALIA - THIS WORK AND THE C.S.I.R.O. WORLD COLLECTION OF PROMISING TROPICAL GRASSES AND LEGUMES ARE BOTH IMPRESSIVE AND UNIQUE. THEY HAVE UNDOUBTEDLY CONTRIBUTED TO MAKE SIZEABLE AREAS OF TROPICAL GRASSLANDS IN AUSTRALIA BOTH EFFICIENT AND PRODUCTIVE. WHILE THIS IS IMPORTANT FOR AUSTRALIAN AGRICULTURE IT HAS AN EVEN GREATER POTENTIAL FOR OTHER TROPICAL AREAS AND ITS WIDER TRANSFER AND ADAPTION^{3r} TO THE THIRD WORLD WOULD MAKE A SIGNIFICANT CONTRIBUTION TO THE WORLD PROTEIN PROBLEM.

AT PRESENT A LARGE PART OF THE AUSTRALIAN EXPERTISE ON TROPICAL GRASSLAND IS BORROWED ON AN 'AD HOC' BASIS BY OTHER DONOR AGENCIES WHO LACK THE HOME-BASED BACK-UP TEAMS THAT YOU HAVE IN YOUR RESEARCH INSTITUTIONS HERE. NO OTHER DONOR AGENCY HAS THE SCIENTIFIC EXPERTISE TO CONTRIBUTE TO TROPICAL PASTURE DEVELOPMENT IN THE WAY THAT AUSTRALIA CAN AND IS DOING. HOWEVER, A LOT MORE NEEDS TO BE DONE. I AM GLAD TO SEE THAT TROPICAL GRASSLAND RESEARCH OVERSEAS IS EXPANDING UNDER YOUR NATIONAL BANNER - I HOPE THIS TREND WILL CONTINUE SINCE IT DOES REPRESENT A POTENTIALLY UNIQUE AUSTRALIAN CONTRIBUTION TO THIRD WORLD DEVELOPMENT.