Impressions of the New York Conference: **Veronica J. K. Milligan**

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New York in June is not altogether the best of places to be; the temperature is around 90° F and there is a humidity that causes little beads of perspiration to trickle off the end of your nose. Most of the buildings are air-conditioned, but when you walk out into the street, the smell of hot, unpleasant air greets you. Moisture seems to be rising from the network of rivers on which New York is built. The best place to be on a hot evening is at one of New York's numerous cinemas which are efficiently air-conditioned. The pavements vibrate as the trains rattle through the underground. The "subways" are only just below the surface as New York is built on rock. The large American cars race through the streets and taxi drivers dismiss you nonchalantly as they pass you by. Altogether New York can be a lonely city.

How lucky I was to be a guest of The Society of Women Engineers! American hospitality in our case was very efficiently organized. Receptions were arranged by many of the large engineering firms. Private families arranged dinner parties. Tours were organized. We were never allowed a dull moment. One of the most impressive visits was to the World Fair. Man's wondrous contributions of beauty and of progress and the extent to which they have benefited the rest of his fellow-men are exhibited at the New York World's Fair. Under the towering unisphere are assembled the arts and ideas, products and progress of nations and of people across the world, based on the theme of peace through understanding. We saw the U.S. Electric Power and Light Companies' "tower of light." A beam of light concentrated by reflectors from twelve search-lights adds up to 12.000 million candlepower. 1t is developed to simulate the sun in space research. Each lamp is less than three inches in diameter and 19½ inches long, yet produces a light as bright as 8.775 million hundred watt bulbs. The General Electric Company demonstrated a controlled nuclear fusion which was very spectacular. Pure energy was liberated from deuterium gas at a temperature of over 20 million degrees Fahrenheit. The fusion was a climax to a vivid display of Disneyland lightning effects on a wide screen in a domed roof. The stage itself rides around to give a terrific impression of space. At General Motors' Futurama we were whisked along on a conveyor-type car and given a series of glimpses into the future-underwater worlds of weird towns under the sea-miracles of the future such as underwater drilling for a substantial part of the world's oil supply and diamond mines on the floor of the ocean. It depicted the underwater world more certainly than space as the future development of man. Factories were seen on the sea-bed, perhaps not so futuristic after the lecture which we later received on oceanology by our Russian delegate. Scenes changed and great forest clearings were seen. A great beam hacked its way through the jungle, followed closely by a high- road building vehicle. A concrete highway was made while you waited. Next we saw a desert farmed by remote control. Desalted sea water was being used to irrigate the land. A farmer controlled his cultivation with push-buttons in his farm house. Vast highways were shown in the cities of the future with vehicles controlled electronically. Is this to be the answer to our traffic problems or is it to be the city development shown where these highways terminate and automatic carriers take over for the central city travel?

Another interesting visit was to the Con Edison's 275.000 kilowatt atomic power plant at Indian Point. Twenty-four miles north of New York City, it went into operation in 1962. It supplements the Con Edison's system of generating stations that serve some eight million people in New York City and Westchester County. We received an excellent lecture on the operation of this plant and were conducted around the conventional part of the power plant.

Con Edison was the first utility in the U.S.A. to announce plans for an atomic power plant. In 1956 the " go ahead" was given to the 100 million dollar project. The Con Edison reactor uses thorium as well as uranium. It is a chain reaction. Pressurized water carries away heat. There is a primary and secondary water-system and oil is pre-heated and fed-back into the plant. The chemical equipment and processing plant is outstanding, the domed building being the nuclear section. The roof weighs approximately 7,000 tons and the stack is 400 ft. high. En route to this proud possession of the American Company, I was most surprised to see the condition of their distribution lines. Many times I have complained bitterly about the appearance of our overhead distribution and its destruction of scenic beauty, but by comparison with American distribution, ours is a picture… Poles straggle alongside the highways, poised at giddy angles and wires of all descriptions are festooned around them. To say they look like Christmas trees is an understatement. High voltage medium voltage, low voltage telephones, everything all draped on the same poles. Following our trip to Con Edison's Plant, we were entertained at the famous Patricia Murphy Candlelight Restaurant. After an excellent meal, informal entertainment was provided. We were all issued with Red Indian head-dresses and pipes of peace, and told we were to have camp-fire celebrations. All nations participated by singing their national folk songs. Even the gentleman delegate from Uganda sang a song. The British delegation reduced party to laughter by singing "Clementine" with great gusto. Another of our conducted tours was around the United Nations Building. Situated between 42nd and 48th streets, the 18 acres were purchased by John D. Rockefeller Jr, in 1946, from the City of New York, and then gifted to the United Nations, a completely independent sovereignty maintaining its own police force and postal system. We were given a lecture on the history of the United Nations and it was pointed out that whereas originally women were engaged only in the Status of Women and the Social Committee, they were now actively engaged in many branches. Five official languages, English. French, Spanish, Russian and Chinese may be heard over headphones provided.

An evening cruise was taken on the river, a very enjoyable evening. The city is almost entirely situated on islands.

To me, the most interesting part of the visit was the Conference itself. More than 500 women engineers and scientists from thirty-five nations and all 50 states of the United States of America shared experiences, plans and aspirations during the conference. They showed that women are making outstanding contributions to science and technology throughout the world. Speaker after speaker pointed to the many ways in which science and engineering are contributing to improved world living conditions. The possibility of co-operation in achieving the outstanding potential of the future throughout the world was emphasized. Speakers, both men and women, mentioned the inadequate supply of trained personnel to implement future world needs and stressed the important part that women can play both as educators and as engineers and scientists.

The President of SWE suggested that the world was trying to enter a new era of human understanding and international co-operation. Scientists, men and women alike, are looking to the future needs of humanity. The conference provided a method of broadening engineering and scientific vistas for the future. Technical progress properly applied can be a strong force for good, acting to increase human dignity and ease the burden of hunger, ignorance, and despair that afflict so many of our fellow-men throughout the world today.

Dr. Lillian Gilbreth, the keynote speaker, is herself a symbol of progress. As a world-renowned management consultant, she has spent her life in studies, planning and activities that create the opportunities for progress.

Dr. Trytten, (U.S.A), gave a lecture on "Requirements for Engineering and Scientific Manpower." He spoke of the untapped reservoirs of talent in our population and emphasized that the greatest unused potential in regard to engineering and scientific talent is that of women. He described the effects of the 1939-45 war in awakening the nation to the need for more trained engineering manpower. He discussed the findings of the latest National Science Foundation-

Bureau of Labour Statistics report. Assumptions were made that relatively high levels of economic activity would continue and there would be a steady increase in the gross-national product.
Also it was assumed that space and arms expenditure will continue to rise and the economic and social patterns of the nation will not undergo any great changes. The results were tested and analysed and the following trends noted: In the U.S.A. over the 1960 decade, 69% increase in requirements of natural scientists; 67% increase in requirements of engineers He noted that because of the time factor in training engineers, manpower strategy in a nation must of necessity be long range even though the transient effects in the market place may be turbulent. He dealt with the ever-present need for flexibility such as was evident during war time, but spoke however of the difficulties arising out of the variation in both quality and quantity at universities and even at engineering schools. Dr. Trytten pointed out that we are trying to adjust our ideas to the changes occurring in this, the most dynamic decade perhaps in the history of the world. There was a need for a national science policy. Enormous benefits have already been obtained by public support of research into agriculture and public health. The speaker discussed the need for a new engineer, the man whose base in science is broader and deeper, and whose role will be at a higher intellectual level than has been the case traditionally. The discussion moved to the employment of women as engineers. Dr. Trytten spoke of the report of the American Association of University Women that " discrimination against women in employment is in part a reaction to the lack of career planning by women." The changing needs of society will probably be the impetus to bring about a change in the status of women. The changing nature of jobs, such as the introduction of automation, opens more opportunities for women as engineers. Women's organizations and other interested groups will need to face the realities of intermittent employment for family raising, for example, on the part of women, and plan accordingly. Perhaps one should say that so far as woman-power in science and technology is concerned, there is likely to be no over-supply, but there is a definite under-utilization.
A paper was read on behalf of Professor Isaacs of the University of California on "The Planetary Water Problem." It dealt with the general topic of supplying. controlling and conserving water as it relates to the requirements of the world population. We learnt that annual evaporation from the oceans is of the order of one metre. Some one-third to one-fourth of this annually falls on the land surface. By conventional agricultural standards this rainfall is in total about adequate for optimum watering of the entire earth's land surface. The total world-wide annual precipitation is some thirty times the water necessary to supply food for the human race by conventional agriculture. However, the distribution is considerably varied and the present geological formation of the world greatly hinders distri- bution.
Some 11 % of the world's land surface is now cultivated or pastured and there is an additional 7%. mainly in Africa, that is cultivable by present technology. There are vast areas for the expansion of agriculture. In particular the principal expansion of agriculture has been into the deserts by irrigation. Soils are often fertile and existing crops and agricultural methods are immediately suitable to these areas. Continual irrigation by canal produces an accumulation of salts and produces problems which are difficult to correct. This position together with primitive agricultural methods applies in West Pakistan which holds 1% of world population and 1% of its cultivated land yet is unable to feed itself. It is a curious matter that man has made so little progress in the great rain forests of the world which comprise 15% of the world's land area. Conventional agriculture is almost completely unsuccessful in these rain forests as only a thin humus overlays the highly acid mineral soils. Destruction of the organic material and erosion are an immediate result of cultivation. The application of subsidies to desert agriculture in the U.S.A. tends to mislead us as to the apparent cost of alternative types of agriculture and alternative

sources of water. It was pointed out that the total water that the human race has used for drinking throughout its entire history is under one-tenth of that used for agriculture annually. The water problem is not merely one of de-salinating of sea water, for if the sea were fresh water only a few problems would disappear. The problems of water are really quite different from the usual concept. Considering agriculture and natural waters man has three general approaches to accommodate his water needs: 1. Change the natural distribution either through climate and weather control or by direct physical transport. 2. Develop new agricultural techniques: 3. Demineralise saline water. Underground storage in aquifers rather than in reservoirs and other evaporation control in general can aid the salinity problem. The storage capacity of these aquifers is sometimes immense. The aquifer of West Pakistan, for example, has I00 times the capacity of the great Mangla Dam. Understanding the manner in which biological systems handle water, and salt, may provide vital clues to many aspects of these problems. Only the very largest nuclear powered de-salination plants hold any promise of significant aid to agriculture. Water by this method is so dear that it is of marginal value even to the most valued crops. It could be of use, however, for agricultural water where the economic development of the area justifies it. Most desalination processes require large energy outputs. The ocean is one of the great energy reservoirs in the world, and if this could be harnessed, then much might be achieved. So far as transportation is concerned, tankers at present are not very large, but new materials may permit the construction of huge containers for the transportation of water to the arid regions. Transport of the Antarctic.