

expected to grow faster than population growth and likewise faster than the per capita income.

Although quite impolite to say, it is a fact that our fathers, like aquatic microorganisms, liked to live along rivers, lakes or any other water area available and we follow in doing the same. We simply need water for drinking, cooking, washing, industrial cooling, transportation, food production and recreational purposes. At the same time we also use water as a waste receiving body, and a natural waste disposal. Municipal sewage, night soil, industrial waste, city garbage, unconsolidated surface soil and other nutrients, all flow or are dumped into the water. All these wastes and refuses are forming the so-called pollutants of water. The Tan-sui River and the Kee-lung River are two typical examples.

These pollutants give the water an unpleasant color and odor, make it toxic and are the cause of waterborne diseases. To a certain degree polluted water is harmful to vegetation growth, kills fish and degrades the water used in our water supply system. The general biochemical process is that when the concentration of pollutants reaches a certain level, dissolved oxygen in water will decrease rapidly so that fish cannot survive and then general food chain will be destroyed tending to an anerobic condition which is the best environment for pathological bacteria. Therefore to control the quality of natural water is simply to control all waste and refuses going into the water. Accordingly municipal garbage must be buried, or incinerated. Sewage and industrial waste must be treated the same way and unconsolidated surface soil and other

Quality Control of Environment

C. C. Wang (王章清)

Mr. Chairman, Gentlemen & Friends

It is a great honor and pleasure that I am asked to speak to such a wonderful gathering of your club. Being a civil servant I am afraid that my speech as a professional would be of little or no interest at all during this non-professional happy occasion. Nevertheless I would like to raise a subject, which might be conceived as semi-professional, because it is a part of my job.

The subject is "Quality Control of Environment", with which we have so many experiences and with which we are so seriously confronted. To be more exact, technically speaking we mean by "Quality Control of Environment" water pollution control, air pollution control and land use control.

As we know, contemporary society depends on men's ability to make fundamental changes in the natural environment. This society cannot exist without large scale cleaning of forested land and plowing of prairies, without changes in natural drainage, and without conversion of rural landscapes into compact urban places for industrial and commercial processes. Through this economic behaviour, in using natural resources to reach higher levels of income, incidental "side effects" are generally also produced. One of these side effects is the deterioration in the quality of our physical environment. Unfortunately the demand for a "good" physical environment is sometimes

control in the United States, dust fall in Chicago decreased from an average of 395 tons/square mile per month to 43 tons. In 1965, dust fall in the cities of Taipei, Keelung, and Kaohsiung, was respectively 58, 59, and 60 tons/square mile per month.

Generally speaking secondary air pollutants are more intractable and more dangerous to health than primary pollutants. They do not come from any industrial, municipal, or household sources, but are produced by photochemical or physico-chemical interactions between primary pollutants within the atmosphere. The most objectionable pollutants of this type are from oxidation of hydrocarbons such as carbon monoxide, sulfur dioxide, etc. The exhaust from gasoline engine automobiles is one example. Latest figures (January 1963) indicated that the 3 million cars in the Los Angeles area emitted some 8,000 tons of carbon monoxide and 1,650 tons of hydrocarbons.

We are glad to learn that our government has taken action to stop coal burning in the city of Taipei and dust fall has been declining since the action.

Speaking of the physical environment of our inhabited locations, more attention should be given to our urban places. Urban space takes less than 1% of the nation's area, but it houses more than 3/4 of the total population in the USA, 54% in Taiwan. It produces well over 4/5 of the nation's economic output in the USA and at least 50% in Taiwan. This massive concentration suggests the critical importance of the urban efficiency to the national economy.

By urban environmental quality. I never forget what Aristotle said: "The government's responsibility to their

nutrients must be controlled in one way or other. This is not only a matter of technology, but also and more importantly a matter of public decision. What quality is required for our natural water, based on our standard of living or on our per capita income? Will the decision be made only in view of public health or for recreation as well? How much is the phosphate percentage allowed in the water, for instance 0.05 ppm or 0.5 ppm, which differentiates millions of dollars? The cost of the sanitary sewage system of the city of Taipei was estimated to be 1.5 billions NT dollars.

Are we willing to pay this cost for the enjoyment of the good quality of our sanitary environment or let the Taipei waterworks abandon its intake along the Tan-Sui River to pay millions of dollars to get its water source hundred miles away? Or leave the two rivers as a gigantic septic tank for our children?

These questions are generally not answered by our G.N.P. It is a problem to the engineers and economists, to the government and to the public. With the exception of North America and Western Europe, almost every country wants to solve this problem but fails in doing so, so far.

Air pollution substances are divided into two categories: Primary and secondary pollutants.

Primary pollutants come from industrial, commercial, domestic, transport and agricultural activities, and appear in the form of dust, fumes, and droplets. They dirty buildings and other articles, corrode metals and affect life processes. Coal burning is usually the main cause.

Since between 1928 and 1962 the measure of air pollution

ally integrated. Planners tried to unite whole areas as one body by the so-called regional planning, but the question is what is the optimum government organization to manage the region, i.e. the land use, the natural resources, public works and utilities, and other quality control of the environment? There are many and different systems in this country as well as in the U.S. and in other countries, but so far they are still in a state of trial-and-error, and nobody could optimize them yet.

To conclude with, the problem of quality control of physical environment is very comprehensive, but not contemporary. Our environment is much more complicated than our fathers', but our environmental quality is not worse than theirs. For instance, aspects of air and water sanitation in urban regions have been remarkably improved in recent decades. Others have been changed also. Therefore, I am still very optimistic along this line and I hope all of us are.

Thank you very much and I welcome your comments.

(本文係王章清學長自美返國後，應台北扶輪社之邀所作演講)

citizens is their safety and welfare." For these, very large amounts of money must be spent, and the larger the city, the worse the quality of the environment, and of course we have to pay more. When a city's population is doubled, its cost in administration will be 10 times increased. The problem is that we do hate city life because of its environment, but we are all lured to stay in the city. When a city is over 500,000 in population, it grows faster and faster, and accordingly its environment grows worse and worse if its quality control is not sufficient.

It is not my intention to enter into details of what we need for urban land use, but I want to raise two fundamentals associated to our urban land. One is the problem of the cores of cities, which is particularly difficult to treat systematically. How to determine what kind of urban development to meet the aesthetic preferences and practical utilization? It is true that urban renewal efforts have been desired to relieve the ugliness of a slum environment. Billions of dollars were paid in the U.S. for the urban renewal business, but few would deny that still many of their cities are monuments to ugliness.

The Chung-Hwa one-mile market in Taipei City is another example.

The second problem is the government organization over the urban land, particularly over a metropolitan region. Cities cannot be alone. They may be a big city with a series of satellite towns or several cities combined to be a metropolitan region. These cities to cities or cities to towns are geographically and politically separated, but they are socially, economically, and physic