

HAWAII'S INDUSTRIAL REVOLUTION

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In 1939 an island community was girding itself for the coming world war. Its economy, for two decades geared to the pursuits of peace, was suddenly shifted to defense. Serious thought went into the problem of convoys. The food problem loomed large, for this island community had been importing two-thirds of its food supply from abroad in exchange for the products that it sold on the world market. Only 20 per cent of its land was in crops. Could this community survive the impact of war? We all know that it did. This community which has been an example of democracy was Great Britain. I have purposely chosen the case of Great Britain for my introduction because it seems so closely to parallel the case of Hawaii. I hope in this way to suggest as dramatically and strongly as possible my thesis that Hawaii is essentially an industrial community integrated into the world economy, that its crises grow out of world events over which it has little control, that its problems grow out of its industrial character, and that in planning for the future of Hawaii we can plan intelligently only if we keep in mind the implications of this parallel to Great Britain.

The parallels between Hawaii and Great Britain are striking enough for us to ponder. Like Great Britain, Hawaii imports two-thirds of its food supply. While about 20 per cent of Great Britain's land is in agricultural crops, only 7 per cent of Hawaii's land is devoted to agriculture. The proportion of people engaged in agricultural work has steadily declined in both these island communities. Like its European model, Hawaii has little to fear from natural disasters of the sort which imperil subsistence economies. Instead it is vulnerable to the crises of the world market and of international relations, which are accentuated by the insular character of both communities.

For seventy-five years Hawaii has been dominated by the sugar industry, to which has been added more recently the pineapple industry. It is, of course, an obvious fact that the major part of this "agricultural" economy is commercial and industrial, producing merchandise for a wider market. It is commercial by virtue of its integration into the commercial life of the Territory centered in Honolulu with its lively trading tradition of a century and a half and its powerful and long-established commercial houses. It is industrial by virtue of its corporate organization which in Hawaii involves a control not only over the final manufacturing processes in which its two major marketable products are involved, but also over the earlier farming processes, and in this respect it differs from most other areas where sugar and canned pineapples are produced. Its corporate structure also carries with it a control over the total labor force involved in the industry. The corporate structure is further highly integrated through the agency system, the Hawaiian Sugar Planters' Association, the Pineapple Growers' Association, and the Employers' Council. Sugar is represented by a lobby in Washington and the tariff protects the sugar industry from foreign competition. Sugar and pineapple production in Hawaii is in every sense of the word mass production industry.

Although a decade or two ago this picture of industrial Hawaii was still interpreted by some as being in conformity with the plantation system that developed on the colonial frontier of European civilization and although some students of the plantation at that time foresaw a characteristic development in Hawaii in the direction of the break-up of large agricultural

plantings and the growth of an indigenous peasantry,¹ even then the corporate and integrated character of the forces controlling the whole productive process in both its agricultural and manufacturing stages prevailed, and only labor was not correspondingly organized.

As a sociologist I am particularly interested in the people who live in this highly industrialized community. Do they have the characteristics and way of life of folk peoples, of peasant peoples, of colonial labor, of rural farm people, or of the industrialized and urbanized peoples of the world? It is clear that the picture of Hawaii is not that of a primitive subsistence economy like its sister islands of the broad Pacific. The fish and poi economy of the early Hawaiians has all but vanished. My further remarks will be directed to showing that Hawaii is no longer a colonial economy to which unskilled laborers are brought from all parts of the world. Hawaii is not becoming a peasant economy of the sort that characterized the village world from which so many of its labor importees came. It seems improbable, finally, that Hawaii is becoming the kind of a community of farmers which characterizes the agricultural areas of the United States. An objective view of the people who make up Hawaii's population is that by and large they have become urbanized. They show the characteristics of urban rather than of folk, peasant, or rural people. They participate in the world economy. The social currents to which people in Hawaii respond are those of the Great Society. They are in all significant respects part of the dynamic industrial mass society of which all Americans are a part. They help us to realize how real is the industrial revolution which Hawaii has undergone.

That this is true can be easily documented. Demographically, for instance, the people of Hawaii show not the characteristics of peasant populations, but those of the populations of the industrialized world. Hawaii's birth rates have been dropping and are now comparable to those found in the cities of the West. The remarkable thing in this drop is that already in the second and third generation it characterizes the immigrant groups who left their peasant villages to work on Hawaii's plantations. The crude birth rates of both the Chinese and Japanese in 1950 were about 25 per thousand,² placing them in the class not of the Chinese and Japanese of the home countries but of the industrialized Americans.³

Among peasant peoples death rates fluctuate markedly around an average of over thirty. Hawaii's death rate has not fluctuated widely and has been one of the lowest in the world, below 10 per thousand. The infant mortality rate, probably one of the best indices of general health standards, experienced a dramatic drop in the two decades after 1920 and has now become stabilized at the unusually low figure of between 25 and 30 deaths of infants below one year of age per 1,000 infants born per year. This rate is

¹For instance, see Edgar Thompson, "Population Expansion and the Plantation System," American Journal of Sociology, Vol. XLI (November, 1935), pp. 314-326.

²In the absence of final U.S. census data, exact rates are not yet ascertainable, but each group is very close to 25 according to available data.

³The crude pre-World War II birth rate of Chinese in China and Formosa, i.e., under peasant conditions, was, according to the best estimates, around 40, and even above. The birth rates for rural Japan in the 1930's were estimated to be over 30 per thousand. See Warren S. Thompson, Population and Peace in the Pacific (Chicago: University of Chicago Press, 1946), p. 179 & p. 96.

below the national average of the United State, and is in contrast to such infant mortality rates as 150 to 250 in India and over 100 in Japan in the 1930's.

Even in the "formal" sense of the proportion of people living in the city, Hawaii is highly urbanized, having about 50 per cent of its total population in the city of Honolulu and a large part of the rest in the several bigger non-plantation cities of Hilo and Wahiawa and in the plantation towns, which in themselves have few typically "rural" characteristics.

The balance of migrations within the Territory is cityward -- except in times of depression, when people either move to the outer islands or leave the Territory, as during the thirties and in the recession that developed after World War II. This migratory responsiveness of people to economic forces was called mobile equilibrium by R. D. McKenzie, the human ecologist, and contrasted by him to the biological equilibrium of pre-industrial peoples. Among the latter, hard times are met by famine, war, epidemics -- typical Malthusian checks to over-population. In the parts of the world where industrialization has occurred, difficult times are met by the surplus population moving away to areas of relatively better opportunities or at least of better economic security. In terms of this contrast, Hawaii is clearly a part of the industrialized world community.

Hawaii's population, furthermore, reflects the high educational standards of industrialized nations. The last literacy statistics were obtained by the 1930 census. While the Oriental groups at that time still had relatively low rates, the adult pure and part Hawaiians had the unusually high rate of 98 per cent literate.

The effective influence of World War II and of the ILWU in raising the general level of wages in Hawaii has brought wages to levels by no means equal to those of the highest paid workers on the Mainland but way above many areas. Spokesmen for the pineapple and sugar "industries" now frequently boast that their workers are the highest-paid year-round "agricultural" workers in the world. This very fact is, of course, a reflection of the decreasingly colonial and increasingly industrial character of pineapple and sugar production in Hawaii.

The way of life which the people of Hawaii increasingly lead is that of modern dynamic society. It is not a society subject to well-established folkways, according to which the major situations are faced by traditional definitions. Nor is it a society with a rigid social structure. Rather, in Hawaii society is in a constant state of flux, just like the wider society of which it is in so many respects a microcosm. Four aspects of this urbanized way of life can be mentioned.

In the first place, we see in Hawaii the evidences of the basic moral conflicts and dilemmas which characterize modern America and Europe. Many forms of Christianity and of Buddhism are well represented. Each ethnic group has brought along its own answers to important moral problems. No doubt, every important view on the many moral issues of today could find its spokesmen: for and against easy divorce, for and against loyalty legislation, for and against organized gambling, and so on. New schemes of life in the form of cults and social movements of all sorts are introduced into Hawaii almost as soon as they make their appearance elsewhere, one of the most recent of many being Dianetics.

In the second place, Hawaii is concerned with an unceasing flow of issues, including its own as well as those of the wider world. The issue

growing out of the dismissal of MacArthur was debated as avidly in Hawaii as anywhere in the nation. Hawaii's own issues are like those facing the States. Many of the issues emerge particularly at the time of the meeting of the legislature and the legislators are subjected to the same kinds of pressures exerted in much the same way as on the Mainland, and they respond to them in similar ways. Issues are created by the presence of a multiplicity of interest groups: industries, employers' organizations, professional organizations, unions, occupational groups, property-owners, athletic groups, educational groups, religious groups, etc.

In the third place, Hawaii is subject to changes in fashion. In the field of clothes, the number of women who wear their native costumes grows smaller from year to year. Not only are women alert to the changing fashions of the Mainland but they respond to a localized fashion movement involving changes in the so-called Hawaiian informal clothes, such as holokus, muumuus, and holomus, and men too have become involved in this local fashion movement. Just as elsewhere fashion is increasingly invading almost every area of life, including courtship and marriage, child-rearing and education, speech, music, and architecture to name only a few, and in these areas is replacing the sway of traditional group ways.

In Hawaii there is in the fourth place an atmosphere of the toleration of differences, an aspect of which being what Romanzo Adams identified as the mores of racial equality. This does not mean that there are no prejudices. The people of Hawaii do indeed have a congeries of prejudices. But such a variety of experiences and so many contradictory prejudices impinge upon the individual as he has personal contacts with a variety of people that his prejudices are always subject to change or at least to self-restraint in his expression of those he has long held. For the student of stereotyping, of the practice of judging people according to the social types into which they seem to fall, Hawaii offers a constant challenge, for the significant thing is that while the social types or group stereotypes are legion, it is almost impossible to reach general agreement about what they imply. It is primarily in times of grave crisis and general hysteria that certain prejudices have acquired an intensity and wider acceptance, only to decline or disappear with the passing of the crisis.

This qualified toleration is in great contrast to the situation in a folk society characterized by rigid ethnocentrism, a stable group-oriented view of the outside world, of alien peoples, and their ways.

It is difficult to induce an urbanized people, such as we have been describing, to show much enthusiasm for agriculture, except during periods of great depression. The records of the University indicate that the proportion of students studying agriculture at the University of Hawaii has through the years not changed much, in spite of great emphasis on agriculture, and even with the recent establishment of a college of agriculture, the percentage of undergraduate students in agriculture is today only 4.9 per cent, as against 5.6 per cent in 1935-36 and 7.5 per cent in 1922-23. This apparent lack of interest in agriculture on the part of students only one or two generations removed from the soil in a land-grant state university of a community which calls itself "agricultural" confirms my notion that it is unrealistic to call Hawaii agricultural. In England, too, efforts to stimulate the expansion of local food production meet with consistent failure.

Summarizing the above, I may say that in the character and way of life of the people of Hawaii we see reflected an economy which, although

founded on agriculture, is essentially industrial in over-all structure and in its sugar manufacturing and pineapple canning processes, and which is tied closely to century-old commercial establishments in the trading center of Honolulu.

This industrial community producing only a third of its own food had, like Great Britain, to face the crisis of World War II and it will be well to tell briefly what happened.

In the first place, there was the problem of securing sufficient food. As Kraemer had pointed out, the committee in charge developed several alternative plans involving emergencies such as that the island of Oahu would be cut off from all communication with both the Mainland and the other islands of the Hawaiian group. These plans called for the plowing up of plantation lands and the sowing of diversified food crops. Seeds were accumulated. Pending the putting into effect of such a plan, every encouragement was given and in small measure local production of food went up as a result of this encouragement and the pressure used. But as none of the various serious emergencies which had been envisioned actually developed no plan was put into effect in its entirety. Convoys bringing food successfully came through during the whole war period. It was possible to build up food stocks that would last the local population over a period of months should an emergency arise. The additional acreage outside of plantation areas which was planted to food crops during this period was apparently largely abandoned during the years after VJ-Day, and at present the acreage is back to near the pre-war figure.⁴

A second development was inflationary. Due to the vast amount of defense work in the Islands and the presence of literally innumerable men and women of the armed forces, Hawaii's economy was artificially stimulated by the large amount of spending in Hawaii. As a result, Hawaii, with many other parts of the world, experienced inflation, and the money which paid for the increased wages and higher priced goods, came from the Mainland. How artificial this boom was became clear through the rapidity with which a recession developed in the last third of the forties. The pouring in of money had not resulted in any new industries or great expansion of existing ones. Instead of savings being plowed into the local economy, to make it possible for the new productive workers in the Islands to stay here, they had been dissipated and people began moving away from Hawaii in larger numbers than they were arriving. In the twelve months from July 1, 1949 to July 1, 1950 Hawaii's Caucasian population declined by almost twenty thousand.⁵

To be sure, since the outbreak of hostilities in Korea, Hawaii has been experiencing a new minor boom, one which, however, is destined to be as temporary as that of World War II and probably less important. Nevertheless, because of these recurring international crises, the economic situation in Hawaii has in the 1940's become one in which, as James Shoemaker has been emphasizing in his reports, Hawaii receives more of its income

⁴See Eric Kraemer, Recent Developments in Hawaiian Land Utilization, University of Hawaii, Occasional Paper No. 51, Honolulu, September, 1949.

⁵A recent release from the Bureau of Health Statistics points to a drop in the civilian population of 28,786 in the two years since March 1, 1949. Most of this drop involves out-migration of Caucasians.

by virtue of the presence of Federal agencies and projects than from its own two major industries, sugar and pineapples.

This means that for the time being another basket has been added to the few in which Hawaii carries its eggs, but it is, of course, a rather un-dependable basket.

The third, and probably the most important development, was the rapid organization since 1944 of the vast majority of the total labor force engaged in both pineapple and sugar production into one industrial union and the introduction of genuine collective bargaining into these two industries. This has had the important effect of intensifying, indeed of confirming the industrial character of Hawaii, of completing Hawaii's industrial revolution. It is significant that "agricultural" labor in Hawaii is now sometimes referred to as the most highly organized in the United States.

Before unionization it was still possible, as I stated above, to conceive of the possibility of Hawaii's plantations moving in the direction of a peasant tenure. With the established strength of the union and the development of true collective bargaining throughout the two agricultural industries this development of a peasantry, already improbable because of the increasingly urbanized character of Hawaii's people, is even more remote.

The influence of the union could be seen in the hearings held in Hilo last November before representatives of the production and marketing division of the U. S. Department of Agriculture, in which the spokesmen for the plantations on the island of Hawaii argued for a new contract for the so-called "adherent planters,"⁶ one in the direction of making them more "independent," in that the control by the plantation would be considerably lessened and the planter would assume far greater financial and farming responsibilities. The plantations argued that such a change would be of benefit to both the planters and the plantations, for the quota compliance payments from the Federal government would go directly to the individual planter rather than to the plantation, as now, and because the rate for determining compliance payments decreases as the size of the farming unit increases, the Federal government would actually be paying larger amounts

⁶About one and a half thousand adherent planters, 99 per cent of them on the Hilo and Hamakua coasts of the island of Hawaii, where this system started about fifty years ago, are growing cane in a sort of semi-independent manner, i.e., they have agreements with their plantations in regard to certain plots of land assigned to them on a rental basis for cultivation under supervision of the plantation. The earliest adherent planters cultivated the steep cliffs of the gulches which are numerous in this region. The slopes had never been cultivated to cane previously but the Japanese laborers, with their background of intense hillside cultivation in the old country, were able to eke out their wages as regular plantation employees by taking over such tracts. Later more level lands on the same plantations, all of which are nonirrigated, were also set aside for adherent planters. The plantation gave the planters the benefit of technical information, made loans to them, and directed them in regard to many details. The crops were bought by the plantation with deductions being made for the various services and price adjustments were geared to the sugar-content of the cane turned in and to the price of raw sugar on the New York market.

The system never gained a foothold on the large irrigated plantations of the other islands.

than now, the increases going to the individual planters. At the same time, the plantations would be in a stronger position, because they would be relieved of various obligations which they now have.

While the plantations favored this change, the union, quite understandably, opposed it, and started an organization among adherent planters designed to fight the move. The union argued that there is no assurance that the change would actually benefit the adherent planters, that it might in fact harm them. The plantations claimed that the opposition of the union is due to their fear of losing their influence over the planters. Each side claims to speak for the planters and it is difficult to determine how the planters themselves feel. To date the Secretary of Agriculture has not yet rendered his decision as to whether to allow these new contracts.

This example serves to illustrate, however, how the union can be expected to resist any development in the direction of decentralizing the corporate structure of the industry, and even if the independent planter contract is now adopted on the island of Hawaii, there is little to suggest that it would spread to the level irrigated plantation areas on the other islands, where mechanization is proceeding apace, while on the rugged and rocky Hawaii lands mechanization has serious obstacles to overcome. At the time of the November hearings some editorials expressed the feeling that Hawaii's sugar industry might now be moving in the direction of a separation of the milling or manufacturing process from the cultivating process of the industry, such as exists under the "central" system in the Philippines, but it is problematical that this will actually occur. The union thus serves only to accentuate the natural reluctance of a sizable number of Hawaii's urbanized young people to participate in the sugar industry as independent planters, while they will take up skilled work on the mechanized and highly rationalized plantations. Hawaii's agricultural-industrial structure has reached "the point of no return."

Hawaii's experience in World War II, in the fourth place, pointed up the extreme vulnerability of an industrialized island community with limited resources to wars and general strikes. It is in such crises that the island peoples of Great Britain and Hawaii can see themselves threatened with starvation. It is at those times when talk is rife about the stimulation of home-grown food production. Wars and strikes dramatize for us our great dependence on the wider economy, our complete integration with the world of trade and industry. Hawaii's three peculiar vulnerabilities then become crystal clear and point to the essential dilemma which Hawaii faces.

Hawaii is vulnerable in the first place because it has even more limited resources than Great Britain and other densely populated island communities. For instance, in over-crowded Japan, about 16 per cent of the total land area is devoted to crops, as against 7 per cent already mentioned for Hawaii. In Puerto Rico, an island slightly smaller than our Big Island, into which is crowded a population more than four times as great as that of our island group, about 30 per cent of the land is under cultivation, and in fertile Java, 60 per cent of the land is under cultivation. Those persons who feel that Hawaii can expand its agricultural production should give these figures serious thought. If our cooperating agricultural industries, tackling their problems with capitalistic daring and acumen and high-powered and expertly-conceived scientific research, have not been able to bring more than 10 per cent of our land under cultivation, even after investing tens of millions of dollars in irrigation, how can we expect a great expansion of crop lands in the future?

In the second place, Hawaii is peculiarly vulnerable because of its very insularity. Situated more than two thousand miles from the Mainland it is dependent upon the maintenance of its lines of communication and transportation, at least to the extent of its integration with the wider economy.

Vulnerability comes in the third place because Hawaii's industrial economy has in the past been too specialized. It has too few commodities to offer the wider market in exchange for its essential supplies. The leaders of the sugar and pineapple industries have been as aware of the problem as others, and have engaged and are still engaged in the search for new industries. Up until recently the search has been primarily for agricultural crops which, in the pattern of the sugar and pineapple industries, would find their way as commodities in the world market. The long history of ventures in silk, cotton, rubber, sisal, rice, tobacco, and other tropical crops is dramatic and tragic. The search is now for marketable by-products of the sugar and pineapple industries. The manufacturing of paper out of bagasse is at present being experimented upon.

The tourist industry is often called the "third" industry, but it too, like the other three major sources of income for Hawaii: federal governmental spending, sugar, and pineapples, is not dependable and is not a solution to the vulnerabilities. The pineapple and tourist "Industries" are subject to elastic demands, fluctuating with good and bad times in the wider national and world economies. Federal spending, the coming of tourists, and to some extent the sugar industry, depend on the international situation, over which the people of Hawaii of course have no control. The sugar industry, while subject to inelastic demand, operates in a situation influenced by the national tariff policy, the policy of compliance payments to growers who limit their crops to quotas assigned by the Secretary of Agriculture, and competition with areas of lower labor costs. Unfortunately these critical outside factors are not of a sort where one necessarily compensates for the other and it is at least conceivable that several negative influences could be brought to bear on Hawaii's economy at one time in a way to threaten Hawaii with disaster.

A consideration of these peculiar vulnerabilities makes clear the dilemma which faces Hawaii. On the one hand, Hawaii may, because of its fear of recurrent crises and of utter disaster, attempt to concentrate more on the production of its own subsistence needs. If it does this there must be a dramatic drop in the standard of living and a radical change in the basic orientation and way of life of its people. On the other hand, it may concentrate on the development of an increasing variety of goods and services to be offered in exchange for Mainland dollars. This will tend to keep Hawaii's standard of living geared to that of the nation and will be in harmony with the interests of an urbanized people, but will place them at the mercy of forces over which they have no control and which can effect a cutting off of their means of livelihood.

There is no logical way out of this dilemma. Clearly a compromise is called for, involving first, a limited amount of encouragement to food producers, and second, the development of new industries and of the existing minor ones.

In respect to the former, the encouragement of producers for local subsistence, a number of comments are called for. We cannot expect to develop in Hawaii true subsistence farmers. Subsistence farming did, it is true, crop up sporadically during the Great Depression of the thirties, when for instance, some Puerto Rican families cultivated the steep hillsides of

Roundtop in the back of Honolulu, but as has been stated, such a development can be expected to come only as a last resort in generally bad times and will be started by people at the bottom of the economic pyramid. Many others would respond in the pattern of mobile equilibrium, by leaving the Territory either for their immigrant homelands or for better opportunities on the Mainland.

Local producers can be found only if we recognize that they will inevitably have to be found among persons who have the kind of ambitions, abilities, education, and potential skills which go with scientific independent farming. As our statistics above showed, there is a small but fairly constant proportion of young men who are willing to get the necessary training at the University, and there can be found examples of local men who are very successful poultry farmers, vegetable growers, flower gardeners, etc. These men will not resort to the backbreaking, ceaseless, plodding labor which in the past made Oriental immigrants successful farmers with whom Haole farmers found it impossible to compete. The locally-born youths have discarded such standards for American standards, as becomes quite obvious when the matter is discussed with them. In other words, they bear out my point that the people of Hawaii are now part and parcel of industrial-urban civilization.

The producer for the local market faces serious competition from the Mainland. The fact that Mainland eggs consistently sell for a lower price than locally produced eggs, even though the Mainland eggs are subject to freight charges covering two thousand miles of ocean transportation,⁷ is indicative of the situation. It is not necessary to go into the reasons for the high prices at which local products sell. Suffice it to say that there are involved the difficulties of pest control, uncertainty of the water supply, the cost of fertilizer, and the need to import such things as cattle and chicken feed.

Farm agriculture cannot exist without land. Besides the absolute dearth of cultivable land already mentioned, Hawaii suffers further from an unusually high degree of concentration of ownership of land. Nine per cent of all land in the Territory is owned by the Bishop Estate, while a total of 30 per cent is owned by the ten biggest landowners. It is true that much of this land is too arid or too mountainous for cultivation. The ownership of the land at present under cultivation is, however, also quite concentrated.

This concentration has been considered a serious barrier to the development of small farming and there has been continuous but so far utterly ineffective pressure for the government to find means for breaking up the large estates, in the expectation that such a measure would lead to the development of small farming.

A further difficulty is the lack of water for uncultivated arid but fertile lands. Water has, of course, in the past been brought to such arid lands by the sugar growers. The best cane lands were deserts under the native Hawaiian economy and their development into sugar lands took place as a

⁷In 1950 the mean average monthly price for dressed Island fryers per pound was \$.64, for Mainland fryers it was \$.50; large Island eggs were \$.78 a dozen, large Mainland eggs \$.61. Island and Mainland celery were both selling for \$.11 a pound and in the case of a few vegetables the Mainland price was slightly higher. See 1950 Market Statistics, University of Hawaii, Agricultural Extension Circular No. 304, Honolulu, March, 1951.

result of the expenditure of vast sums of money on irrigation projects, which tapped water resources ten, twenty, and thirty miles away. The central Maui desert, the drier sections of Kauai, and the arid lands around Oahu's Pearl Harbor were thus made to bloom. Forty million dollars is the usual figure given for the total investment in these irrigation projects, a figure which looms very large when it is remembered that the development began in the 1850's when the dollar was worth much more than today. The further development of arid lands seems, however, to be uneconomic. Yet the possibility is frequently discussed. Molokai, for instance, has tremendous water resources which at great cost could be made available to dry but fertile areas of that island, and on the island of Hawaii, the further development through irrigation of the Waimea lands is being seriously considered. These lands are at too high an altitude for sugar production and have been utilized mainly for ranching. While some small farming has already begun at Waimea, a further expansion is contingent on the availability of water.⁸

It is felt by many that either the Territorial or the Federal government must assume the responsibility for such irrigation projects, since, in contrast to the sugar producers, these vegetable farmers are not corporately organized. In December, 1950, William E. Warne of the United States Department of the Interior, made a quick survey of water resources for potential farming areas and stated that thorough studies of irrigation possibilities are called for. Recommendations for studies have, however, been made for many decades. Only liberal subsidies from the Federal government will make irrigation possible in arable but arid lands, for what Cox wrote ten years ago about the irrigation of sugar lands applies equally well to other lands:

There is no general shortage of arable land, and it is generally true that the sugar production of the Islands has tended to be limited by the expense in developing water supply justified at any time by the future prospects of the sugar industry. Irrigation is, therefore, an economic problem, the finding of a balance between the cost of water delivered to a plantation and the earning power of such water.⁹

The second and more important aspect of the attempt to solve Hawaii's dilemma is to encourage industrial development.

All indications are that there will be no further expansion of the two existing agricultural industries, sugar and pineapples. The tendency, at least in sugar production, is rather in the direction of removing lands from

⁸There is also involved the availability of a market to which products can be brought at more reasonable transportation costs than today. The freight rates between Honolulu and the West Coast are only two and a half times greater than the rates between Honolulu and the outside islands. The comparative distances are 2,091 miles (to San Francisco) and between 50 and 200 miles to outside island ports.

⁹Joel B. Cox, "Water and Hawaiian Agriculture," in *Water Supply in Hawaii, A Symposium Presented before the Hawaiian Academy of Science, First Session, Seventeenth Annual Meeting, November 14, 1941* (Reprinted from the *Paradise of the Pacific, February, March, April, & May, 1942, Honolulu, 1942*), p. 10.

cane crops. In the past decade a number of so-called marginal plantations have been liquidated. It is true that with recent advances in the price of raw sugar on the New York market, bringing the price for the first time in two decades to the highs of the 1920's, some abandoned acreage may return to sugar, and it is perhaps fair to say that the acreage in sugar, judging by the experience of several decades, will fluctuate slightly around a figure just over 200,000 acres. As mechanization increases, as the job ceiling for local non-Haoles is shifted upward, and as the general plantation atmosphere is toned up, particularly in some of the centralized towns which are being built and where plantation employees may buy their own homes, the boredom and antipathy which local youth often feel for the plantation may to some extent be dissipated.

The tourist trade may be considered an industry in that it involves invisible exports in the form of services to visitors. There has developed since the end of the war a great deal of enthusiasm for the expansion of this source of income. Some interesting post-war emphases are: attention to early Hawaiian crafts, concern with the picturesque contributions of Oriental peoples and cultures and especially their festivals, a concern with developing hotels for people in the middle income brackets, the establishment of "Aloha Week" in October, a reluctance to cater to visitors seeking easy divorces and gambling and other night-life, and the encouragement of visits to the outside or neighbor islands. The mushrooming of air travel with several passenger planes leaving and arriving in Honolulu daily is a significant development of the last decade. Obviously local people of imagination and ability should participate in the effort to make Hawaii attractive to tourists. They can be trained as guides for Oriental temple tours, school tours, tours of industrial establishments, etc. They can have an important part in the development of hotel facilities. The instability that frequently goes with a tourist-oriented community, however, suggests that other important possibilities should not be neglected.

The concentrated attention which men in the sugar industry are now giving to the discovery of commercial uses for the by-products of the industry has been mentioned. There is also a healthy and new concern with fisheries, flowers, especially orchids, for the Mainland market, the development of crafts (involving not so much the revival of ancient Polynesian crafts as the use of Polynesian art motifs and local materials in the establishment of such formerly uncommon crafts as ceramics and wood carving), and the designing and manufacturing of textile patterns for tropical wear. The Industrial Research Advisory Council established by the 1949 legislature has been concerned with some of these developments.

A few men of experience and vision however see even further and perhaps more important possibilities, and Shoemaker has suggested the formation of a Hawaiian development corporation of the sort now functioning in various United States cities and regions to stimulate new industries. It is of course difficult to cease looking for new products of the soil, when that is where the search has been primarily directed in the past. There promises now to be more serious consideration of the possibility of developing new industries based on modern skilled trades, such as those of the mechanic, the machinist, the electrician, the welder, and on recent techniques, such as electronics. One man of technical know-how suggested, when I talked to him, the possibility of using lava rock in the manufacture of plastics, but claims that it is difficult to interest local capital. In the general absence of locally-available raw materials what seems to be called for is the manufacture of high-priced goods of little bulk and weight from imported raw materials of little weight by the application of modern tech-

niques and highly skilled local labor. Under such conditions transportation costs would become a minor cost factor.¹⁰

There are those who feel that such highly skilled labor can never be developed in Hawaii, but up to now the training of skilled labor in Hawaii, has never been taken seriously, in spite of much talk about vocational and apprenticeship programs. The vocational schools have no outstanding achievements to their credit. At present Hawaii has a dearth of trained skilled workers in the various important crafts. It is a notorious fact that during the period of greatest unemployment since VJ-Day, there was a demand for skilled labor which could not be supplied by local people. Unemployment affected primarily unskilled and semi-skilled workers.

If my arguments are valid about Hawaii's being essentially an industrial rather than an agricultural community and about Hawaii's people reflecting this industrial revolution in their modes of behavior and general outlook, then this lack of skilled labor is an anomaly. It is my conviction that this lack reflects the failure of leaders in business, industry, labor, government, and education to recognize that the industrial revolution has taken place in Hawaii. It is my conviction that if sound training programs are provided, in the form of pre-vocational orientation in the regular high schools, a modern apprenticeship plan, and advanced technological education at the college level, that local youth would respond, and further that local youth is of potentially high caliber.

In his research for a Master's thesis in economics, Richard B. Hill recently discovered that the proportion of male high school seniors wishing to enter apprenticeships in skilled trades is very high, coming to 50 per cent among Honolulu's public high school students graduating in 1949. Today, two years later, however, only 32.5 per cent of these people are working in their chosen trades.¹¹ This indicates both the interest and the lack of implementation of the interest. This interest again bears out the stress of this paper that local people have been profoundly affected by Hawaii's industrial revolution.

Skilled craftsmanship it may be pointed out incidentally, is in the general cultural tradition of the Chinese and Japanese, who form close to half of the local population.

I have tried from time to time to get evaluations of local workers who are in skilled trades by employers who are able to compare them with Mainland workers. It has not been possible to obtain a clear and consistent picture of how local workers measure up, but some judgments have been very favorable to local men. As trained soldiers they have certainly proven themselves superior.

¹⁰I have often wondered what the basis for the Swiss watch industry is. Apparently the major raw materials have to be imported, and it is what the Swiss put into the material by way of skills that makes the industry. These skills have by now been established for many generations, but at sometime there must have been a beginning. If we in Hawaii could find something comparable in some field where the skills had not yet become industrially entrenched in other communities, we would be diversifying in a direction which I feel has promise.

¹¹Richard B. Hill, "Journeyman--Apprentice Ratios, a Critical Analysis," Unpublished Master's Thesis, University of Hawaii, 1951.

While aspects of the above arguments need further study, the general thesis would bear more serious consideration by people who are trying realistically to plan for Hawaii's future, namely that Hawaii and its people have undergone an industrial revolution which places them in the category of the most industrialized parts of the world. Agriculture and rural life are on the decline. Old Hawaii is no more.

What the people of Hawaii will make of the new Hawaii is in their hands.