"How California Can Help the Orient"

A Summary Report

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Dear Sirs:

This is a summary report only and made without reference to notes, most of which have been left behind during the course of an extended journey. A partial purpose is to prepare for a return to one of the campuses, although which one is not fully determined. The alternatives would consist of writing articles or even books, or to be received seriously by some foundation or institution. Inasmuch as one cannot be oversure of external help, the immediate supposition is the writing of one or more theses on the subject matter.

It may seem presumptuous off hand to presume that a single State can contributes much to the well-being of a large sector of humanity. But as one travels one finds that many of the problems being encountered are of similar nature to some already handled in California. We must bear in mind here that the countries which were once under the dominion of Great Britain did not have either geological or hydrological surveys and many of the inhabitants thereof assume that the wealth of California came from the ingenious use of capital grants. It is not easy to communicate that California started out with geological survey and the discovery of Gold; that the pioneers worked the Gold, and thus became prosperous; and that capital grew out of labor in this sense. In many other lands it is accepted that capital must be allotted before projects start and human endeavor and self-reliance are not always deep-seated.

Our foreign policies have seldom been determined by the fact that most people either are or wish to be attached to the land. The term "industrialization" is one of those multi-ordinary non-semantic terms which means something quite different in different contexts. The Goat and the Mongol have done more harm than even vicious invaders and yet have escaped the wrath of historians. Their heritage can be seen in the saline and near-saline deserts, in soil erosion and the failure to establish lasting policies anywhere.

In addition to the problems of soils, there is that of water supply. Mankind is now turning to the sea and Salt-Water conversion. The establishment of a plant in La Jolla has occurred while the writer was out of the country and both the method used and results will have to be recorded after a visit. The reports on Salt-Water conversion research are fragmentary but one should not omit those experiments under the direction of Prof. Howe of the Department of Mechanical Engineering in Berkeley. Since 1958 the costs of operation seem to be fragmented, but the economics of such operations must become known to those lands which are in need of water, where water is the limiting factor in the growth of crops.

A totally different sort of research has been done at Salinas, noting the requirements of trees, etc. Abroad an orchard is an orchard and a garden is a garden. One does not see Mangos, Avocados and Citrus fruits segregated from Rosaceae trees. Indeed one does not see one. One does not see Avocados at all. The use of irrigation and flooding applied alike to Mangos, Citrus, sp., Prunus

sp., and Pomus sp., sometimes along with timber and ornamental trees has resulted in wastage and damage. Specific information is desired and as detailed a break-down as can be had.

Salinity. Prof. Paul Keim of the Department of Civil Engineering has been instrumental in reclaiming lands near Alexandria, Egypt. He has considerable information about successful and non-successful methods and also of the efforts of European engineers in that land. Our governmental agencies are compelled to accept the existence of the United Nations and its various sectors. Some UN organizations seem to have been most efficient in eradicating disease and promoting hygiene (with the resultant great increase in population.) But generally UN agencies have not been efficient in supplying information, methods, and cutting where they have been needed. Therefore anything done by the UN will be ignored here.

But because of the acceptance of UN agencies, Americans abroad and even our governmental technical agencies have not always communicated with one another or shared information and techniques. Salinity is regarded as the major problem of Pakistan and may even endanger the future of that land. Land reclamation and agriculture experimentation is highly organized, even over-organized but not integrated. This has resulted in quite independent efforts to deal with salinity. The writer had hoped to meet Prof. Fireman of Riverside but that technician spent much time in India.

Salinity in Pakistan is being approached from an engineering stand-point with emphasis on the tube-wall policy. As there is not a complete hydrological survey, the wells are often done only at certain levels or strata. On the land allotted to the writer for a future experimental farm, there are three levels of waters, and their composition is known. It is therefore possible to obtain water of required pH, etc. and to forestall the drying of tube-walls, etc.

The complementary work in sowing salt-tolerant crops is not going on. It is known that there are cottons which can be adapted. There are few Date palms. Private objections have been made to Asparagus—many of whose relatives are now used as ornamentals and do very well. The Artichoke was found at one station growing as an ornamental. Only one of the research workers even knew of it as a food crops. Beets cannot be grown too well in the heavy soils and research on Onions goes on slowly. Therefore any reports gathered directly or indirectly at Riverside will be of tremendous use to many lands.

It is known that Iran—not visited—has a huge salt desert. Arriving in India the first trip revealed the problem of salinity, but not any emphasis on it. Areas near New Delhi have been taken out of cultivation but a quick inspection showed that this was more often due to salinity than lack of moisture. This point was confirmed at Poona at the agricultural experimental station there.

Salinity is one the great problems of the world and the work being done both by the University and USDA in Riverside is not so well recognized abroad (or at home) as it should be.

Alkaline Clays: This is one of the great problems of much of India. The top soil has been worn and the lack of policies have diminished harvest returns. No doubt here the first thing needed will be a stable water policy. The scientists know what has to be done and there is plenty of Gypsum available. But there is no organic matter and there is not, as in Egypt, a green manure program. This is being approached.

What is important though is that California has both as a state and as the result of agriculture research, been able to face exactly the same problems of white Alkali, Black Alkali, etc. The Sodium ion is very high in India in soils of high pH; in Pakistan K is the predominant base.

Psychology and Philosophy of the Indians. This touches to some extent other Asian peoples and it is necessary to understand it before facing any X-year program or suggesting methods of using fertilizers on a large scale.

The Indians and some of their neighbors are steeped in an integral approach. They are always trying to integrate or even reaching a point of view called "Holism" by the late Jan Smuts of South Africa. Russians are by-and-large dialecticians and Americans seems to be a mixture of dialecticians and analysts. This has been the cause either of misunderstandings or failures in communication.

Fortunately there is now a large and thriving segment of philosophers who adhere to the integral approach. Seeking a universal harmony or equilibrium into which parts adjust themselves. Not only that but there is now communication between the American philosophers of this outlook and those of India. The details, being unexciting or strange, remain unknown to the press and magazines. But this is going to help promote understanding.

Fertilizer Philosophy. The above is necessary when it comes to a most difficult situation. The term "fertilizer" like that of "industrialization" tends to become an indefinite catch-all word which "solves" everything linguistically and little in fact. The writer had with him the "Garst Plan" which utilizes a Urea base. This is an alternative to the Ammosulph program which has became almost a religion and protocol. Generally—and this is the difficulty—the Ammosulph program has not only been a failure, but caused bitter feelings against Americans and other foreigners. Thailand, for example, will have none of it at all and on a former visit Hong Kong was proceeding in the same direction.

At the present time soil science studies are often related to Geology. The writer feels this must not be changed. Not only the pH but the "faces" become very determinate factors in the establishment of any policy and when one looks at Laterite, Chernozem, Podzols, Sands, Clays and what not, there can be no more a single answer than one can apply a nostrum or panacea for human and animal diseases. What is needed therefore are **soil doctors**.

Tea is grown in lands of low pH, plenty of moisture and even more drainage. It requires both a heavy supply of organic matter and Ammosulph, the latter seems to be most efficacious in lands of acidity and in the presence of organic matter. In the Tea districts of India animal manures are utilized.

At this writing one can see how Ammosulph, Urea, Calcium Nitrate, and various organics can be used as the essential fertilizer for a district or program. India and Pakistan are way behind Egypt in the geological and related surveys. The application of fertilizers without regard to soil texture, pH, quantity and quality of water, etc. has been very costly.

Green Manures. Egypt (which was UAR) has today a most systematic program in this direction. It is plausible that "Islamic" Pakistan might follow her fellow-republic, but jealousy is mixed with admiration and Americans are better in a position to suggest. Berseem is not so widely studied or used in Pakistan and India but before suggesting any legume for a ground cover, one should know the relation of crop to water, soil texture and pH.

Desert Agriculture. Many lands have yet to learn from California and the word here applies both to the booklet of this name and the needs of large areas. Details are not necessary here.

Xerophytes. There has been little proper adaptation of Opuntia. In Egypt they were doing badly, placed only in irrigation ditches. People knew little of the fruit, or the edible parts, or the use of some species as water-storers. In all these lands are Euphorbias and the suggestion is that Opuntias may thrive where there are Euphorbias.

Too little is known of drought tolerant trees. Fr. velutina is a stranger, even, to one's surprise, to some graduates of U.C. In making out a list of trees, experience was added to those listed in "Desert Agriculture" but a trip down to Arizona is also suggested. Drought tolerant trees are badly needed. "Australian Pines" are ubiquitous, but as ornamentals.

Eucalyptus, sp. This genus offers tremendous possibilities both for lands where there is not enough moisture but also for swamp drainage where there is heavy rainfall. Whether it can be used where there is a high water table is unknown to the writer. Unfortunately this is a sort of pariah in parts of Australia and information in particular directions is hard to obtain. Yet in both India and Pakistan places have been visited where gum-trees thrive even more than in California and decidedly better than in the continent of their origin.

California Natives. Sometimes we have gotten into the same outlook as the Australians on gums. Thus Rhus. shrubs could easily be grown in many lands visited and the possibility of using them as ornamentals and for drinks (sherbets) is still untouched.

Pr. lyonii offers untold possibilities both for a stock tree and also for cross-breeding. The areas growing Peaches, Almonds, Apricots, etc., is quite limited and there do not seem to be Prunus stock varieties that easily adjust to the hot summer conditions. However this would suggest a visit to the nursery near Saratoga where only there should be enough data to help peoples in foreign parts.

Food Crops. Here the possibilities are enormous. The Avocado could easily grow where there are Mangos. The Olive could thrive on hilltops which are bare. These, plus the Soybean, will ultimately enable the poorer classes to have a larger supply of non-animal fats. The difficulty is impatience and in adjustment tree-programs with governmental x-year plans.

The small fruits have hardly been started. A Strawberry program would suggest more inter-change (and even x-breeding) between varieties of the eastern USA, western USA, and Japan. In Pakistan one has thought of planting Blackberries, etc., in a district where wild berries thrive. And the fact remains that California has a very large number of fruit crops in common with Pakistan, Afghanistan, Iran and other parts of Asia.

Food Processing. This is one of the worst needs of Asia. There is not even an efficient method of simple grading for market. There is no efficiency in the handling of heavy harvests, nor of a policy for drying. The Chinese dry the Persimmon, yet this possibility is unknown elsewhere. In visiting orchards full of grapes, the word "Raisin" is faced with an attitude nearing contempt.

It is suggested that every encouragement be given to canners, packers, processors, etc., to train mature citizens of other lands as apprentices, both to learn our methods and in case American capital is invested abroad, to act as entrepreneurs. We are here faced with an ironic situation. There

is in Great Britain—and one must assume in the US—a plethora of canning and packing machinery of earlier vintage. The sending of this abroad would remove surplus stocks. In dealing with political representatives of foreign lands they often insist on the latest and best though they have neither engineers nor skilled workers. The same money could establish ten factories if second-hand machinery were accepted; would result in the absorption of far more labor and processing of far more crops. The write hopes to work out details thereon with the Chamber of and interested industrialists.

February 22. 1962

Dr. Hasan Salah, Director.
Plant Protection Section,
National Research Center,
Dokki, Cairo

My dear friend,

As-salaam aleikum.

It is very strange, and enjoyable, how from time to time when facing a quandary one meets some fellow-alumnus from the University of California. This happened again at Poona, Maharashtra State, India. While I was trying to meet my Bombay host, our programs got mixed and I was staying in a hotel in Poona under arrangements by a famous Indian musician whom I had met in San Francisco. While there I learned that one Dr. R. D. Cruz was in the same hotel.

He is a graduate of U.C. and his specialty was Plant Breeding. He is in charge of research and teaching at the Agricultural College. In order to save on laboratory equipment and to utilize the full services of the personnel, the same persons are engaged in undergraduate teams and in both upper division and graduate research. The Fruit Experimental Station is located at the north end of the City and students are taken there for both training and research. The Soils testing and research sections of Maharashtra State are located in another section of the city. And in a third research there is also the National Chemical Laboratory, which is carrying on investigations under methods rather similar to the Chemistry Section, your own National Research Center

I had a full three days with these people and there is every indication that I may return some day—Inshallah—and at least know what to do when I get "home." In this connection I have just written a brief "How California Can Help the Orient." This has been sent to Giannini Hall, but when I return, the matter will be taken up with my friend and mentor, Harry Nelson, Director, Greenhouse, San Francisco City College.

The news that comes from your country is not favorable. By this it is not politics, but the evil effects of the Cotton Moth and other pests. On my previous visit to India, in pushing the five-year plan there were programs of heavy nitrogenous fertilization tried all over with the results of poor stock and pests. Even now there is little understanding of the N-K equilibrium and relations in building up strong or not so strong plants. This seems to be recognized by the research stations but whatever knowledge has been accumulated has not trickled down to the plantations.

Although one does not like to get into politics or this socialist-private enterprise schizophrenia, there is no question but that fixed-period plants operate independent of plant growth. The emphasis at Poona and elsewhere has been to get better stock plants and so attention is paid to breeding. The Nitrogen programs and philosophy are complex and I am going to submit a paper to the Ministry of Agricultural here and also to my friend above mentioned, Prof. Harry Nelson.

The paper enclosed on "The Plant Pathology Section" refers both to organization and procedures. One trusts both of these will interest you.

There is also a small pamphlet enclosed on "Pests of Fibre Crops." There may be no new material here, but at least you can examine it is going on elsewhere. I tried to get Ambassador Hussein of India to visit you, but I am afraid that so many politicos pay more attention to social than to serious engagement.

I think I may have written about the locust problem in Pakistan. Here again attention on political problems led to the undoing of many plans. A cooperative international scheme could easily have forestalled the invasions but this is mostly what was not done. It was not until the "invaders" reached the capital city Rawalpindi, that a common-sense method of calling upon peasants and citizenry to go out and use spades, shovels, knapsack-sprays and poisons was instituted. Everybody was depending on the air-force and at a time when then were international political disturbances.

The University has a complete stock of spray equipment, from the most simple hand-operated on up. Students there are required to take up courses in farm-mechanics. This includes the simplest operations from the understanding, manufacture and repair of simple hand-tools, on up. No step is by-passed. I notice that today there are some good two-men spray-rigs which are comparatively light in weight and so can be moved around faster. These have gas-engines. They are also necessary in a land of small plots and few roads. Heavy equipment can only be employed on highways.

There is some daylight that I may return to California in May. First I shall discuss or have discussion on many matters with my friend, Harry Nelson as above; then go to Giannini Hall and include in my agenda those matters which you have discussed with me. And also I am now on excellent terms with the T C M which is in charge of all agricultural technical matters. It is expected that I shall go on to them again in New Delhi. I understand that the Americans also have one of their international scientific headquarters at New Delhi (the other is in Rome), and if necessary will go there too.

You can understand now it is very difficult for me to carry on much correspondence. So I leave it to you to notify my friends at the Ministry, Vegetable Experimental Stations, El-Shams, etc., that one does not forget but there is a limit to one's abilities. For some time all conversations and discussions with all parties concerned, including all staffs of all American missions have been cordial, encouraging and harmonious.

Sincerely,

Samuel L. Lewis
Sufi Ahmed Murad

February 22, 1962

My dear Harry:

Every now and then one meets a person with whom there is complete rapport and hours may pass like minutes. This was true of my engagement with Prof. V. K. Leley at Poona. He is Director of Agricultural Chemistry but has the wide-eye view which is common to many trained in Indian philosophy and psychology. The whole field is known to him. Thus one can discuss the relation of Plant Diseases to the absence or unavailability of Cu and S in the soils, etc. On this point Prof. Leley and I were in agreement but some of the Plant Pathology people not so.

We also discussed soil chemistry, plant chemistry, etc. We did not discuss the details in the paper enclosed. There is no question that when it comes to the relation of soils to basic geology I feel like an idiot. We did discuss the elevated valley or plateau where Poona is located. It has a rather moderate climate, and is not so hot as Bombay on the coast. It has sufficient rainfall but a very narrow period of rains. There has never been a good hydrological survey, and the subjects like irrigation, well digging, etc; are still in introductory stages. Proper storage has not been done and water is only too often a limiting factor.

Unfortunately the irrigation-complex has hindered tree planting and that is why in another letter I have mentioned Fr. velutina, Pr. lyonii and the need for Olive planting. Hills which are bare receive over 20" minimum, 30" average a year and if this is confined to a narrow period, it should be sufficient for Olive growing. Fortunately I find on my agenda that there is an American at Bangalore, my next stop, whose specialty is the water-requirement of trees. So I am looking toward an interesting visit.

The whole region presents the problems of White Alkali, Black Alkali and too much available Na. I shall let the pamphlet speak rather than memories of conversation. Gypsum is available in large quantities in India and the central government is recognizing its need. But organic matter is not available and the Green Manure program is being instituted. The objection is always against having fields in fallow or to be plowed under when so much food is needed but now the scientists are convincing the peasant-farmers that the totality of yields can greatly be increased by the addition of organic matter.

The discussions were continued at the Soil Stations, but I think California has "solved" many of the problems. Only in comparisons with the land-mass problems seem more acute. It is also recognized that problems cannot be considered separately, that there should be an over-all approach. This has been warmly advocated by Profs. Merchant and Wadia who, in addition to being the leading economists of the Bombay region are also the top philosophers. They have long advocated an over-all approach with emphasis on soil-correction first. With most economists, attention is given to labor, capital and machinery, and "land" has a rather empty meaning.

The above stands out in contrast to my present whereabouts. I am on an Ashram or Yoga-retreat on the South Indian railway not far from the sea. There is a mountain right behind us. There are outcrops of scoria and at times rocks which somewhat resemble the Jaspers of the Sausalito region. But the colors of the rocks and of the soil below would indicate basic Iron and I presume, because of the "pinks," at least sufficient Cobalt.

Yesterday I was taken around the place. Water has been discovered not too far below the surface. My own impression had been, because of the porosity of the mountains nearby, there should be underground streams. The first wells dug were not sufficient for immediate needs but now the underground waters have been reached just at the foot of the mountain and a careful program has been instituted.

Finding this water the Ashram has begun purchasing available lands nearby and giving them to peasant-workers on a share- or partnership basis. There is only a cooperative in regard to tools and water, each peasant being permitted to establish his own program on approval of the trustees. This is done so as to establish an all-around economy. Thus six farmers have been permitted to enter Paddy (rice) production A large section has been given over to Sudan grass as a reserve for the cattle. I am told that this Grass absorbs certain nutrients and holds its Nitrogen longer than other grasses so it has been stored as hay, etc.

There is now a large program of tree planting. Although there are several Coconuts, there is now a program for maximum production which enables the farmer to sell in the open market. Papayas thrive here. (Note—with Goa "freed," will these people also be free to continue to call them mamayas?) Cashews do very well. They are served here soft and cooked, eaten with the rice, etc. There are Guavas here but not many Citrus fruits.

The general program of this region is at least two-story farming—Coconuts and Bananas. I have not come upon Coffee production here but they serve the best coffee-with-milk that I have ever drunk. It is a Mocha type and one can understand why our "mocha" flavor at home comes by mixture of Chocolate with our Coffee. The effect is pretty close. We get Coffee at breakfast and afternoon breaks. At other meals Milk or Buttermilk.

All dung and urine is put into storage pits and is divided on a basis comparable to that of the water-program. Only with the water there is a weekly partition into days and each day is fixed. With the animal-waste the periods are longer and each farmer in turn is permitted to deposit what he needs or finds. There is no dung used for fuel here. There is an Englishman staying here who wanders around the country and he tells me that in practice one of the basic divisions between the Muslims and Hindus is over dung—the Muslims insist on returning it to land, the Hindus to dry it and use is in numerous ways—fuel, houses, brick making etc.

There is a kind of brick made here which partakes of the nature of some of our concrete blocks. The chemistry is very different, owing to its acid-rock base. But this is not all Fe. These bricks are shaped variously according to function.

There are shrubs all around my room and I was surprised to find they are perennial Cotton. The bolls are small, and this is in part due to lack of a pruning program. But when it comes to annual production, etc; it seems that the vines or shrubs give more than the smaller ones generally used in production, with annual or seasonal harvests. One man here does everything "from the cradle to the grave"—looks after the shrubs, gins, selects or sells seeds, spins, weaves and sells or distributes fabrics. It is a quantitative and not a qualitative type and is meant to be so. Still the potentialities in perennial Gossypium and Tomatoes is still before me.

This is written without field notes—left in Bombay, but I am trying to unload both information and pamphlets. I need the space in my luggage because I am getting replacement clothes made

here. This has been a nuisance. Tailors demand deposits, they say for cloth. They live off the deposits and don't care when they deliver—it is only when food runs out they go to work and complete garments. As I have written so often, now abide these three evils: Sex, thought and work and the greatest of these is work!

Sufi Ahmed Murad
Samuel L. Lewis