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CONTENTS

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THE PATTERN OF SUGARBEET CONCENTRATION IN PESHAWAR VALLEY

MUHAMMAD YAQUB ALIZAI*

The Vale of Peshawar lies between 33°—45′ N and 34°—30′ N Latitudes. Its longitudinal extent is from 71°—22′ E to 72°—50′ E. It is 72 miles long and 52 miles wide, with an area of approximately 2600 sq. miles. Appearing like a saucer, the plain of Peshawar lies roughly in the centre of North West. (Fig. I.) It is surrounded on all sides by hills except on the east where river Indus forms natural boundary.

This soucer-shaped basin is one of the most clearly marked and distinct geographic regions. Because of its physical, cultural and economic homogenienty, it remained a single political and administrative unit for long time. In 1937 the Tehsil of Mardan and Swabi were separated and Mardan District was formed.

At present, the Vale of Peshawar is comprised of the districts of Peshawar and Mardan along with the fringes of neighbouring tribal territory.[1] The area under study consists of the tehsils of Peshawar, Charsadda, Nowshera (Peshawar District), Mardan and Swabi (Mardan District). Total number of villages according to Revenue Records in all the five tehsils is 900[2].

Formed by the River Kabul and its tributaries, Peshawar Valley is mostly covered by a thick layer of fertile alluvial soils. It is well-watered and has high intensity of irrigation with the exception of some area in Nowshera and Swabi. As a whole Peshawar Basin is one of the most important agricultural regions in Pakistan.

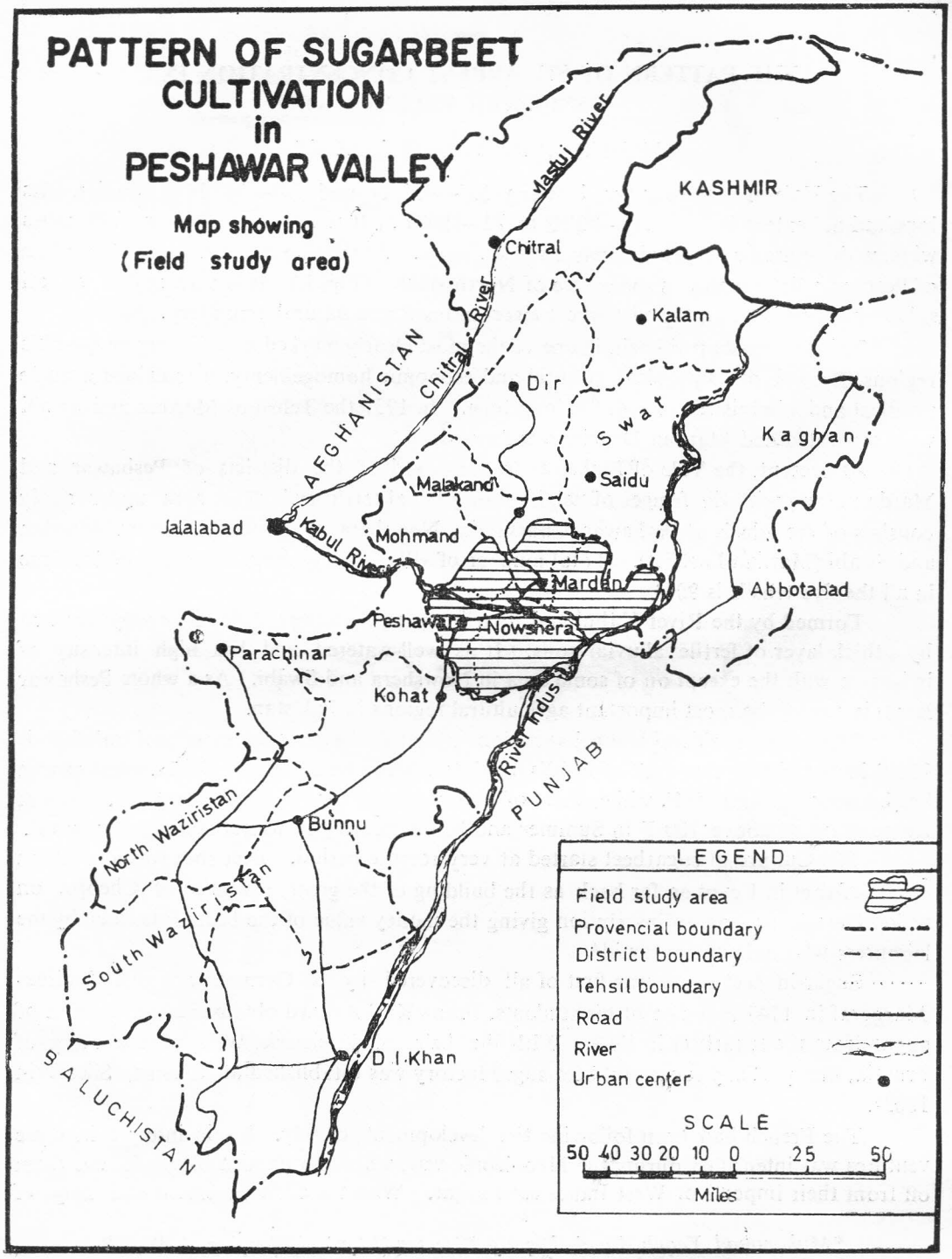
There are considerable local variations but at Peshawar average annual rainfall is 12.80 inches. More than half of it falls in winter. Mean temperature of the coolest month lies between 32° and 50 F. while, that of the warmest month is above 86°F. Actual temperature of above 100 F in Summer and below freezing in winter is not uncommon[3].

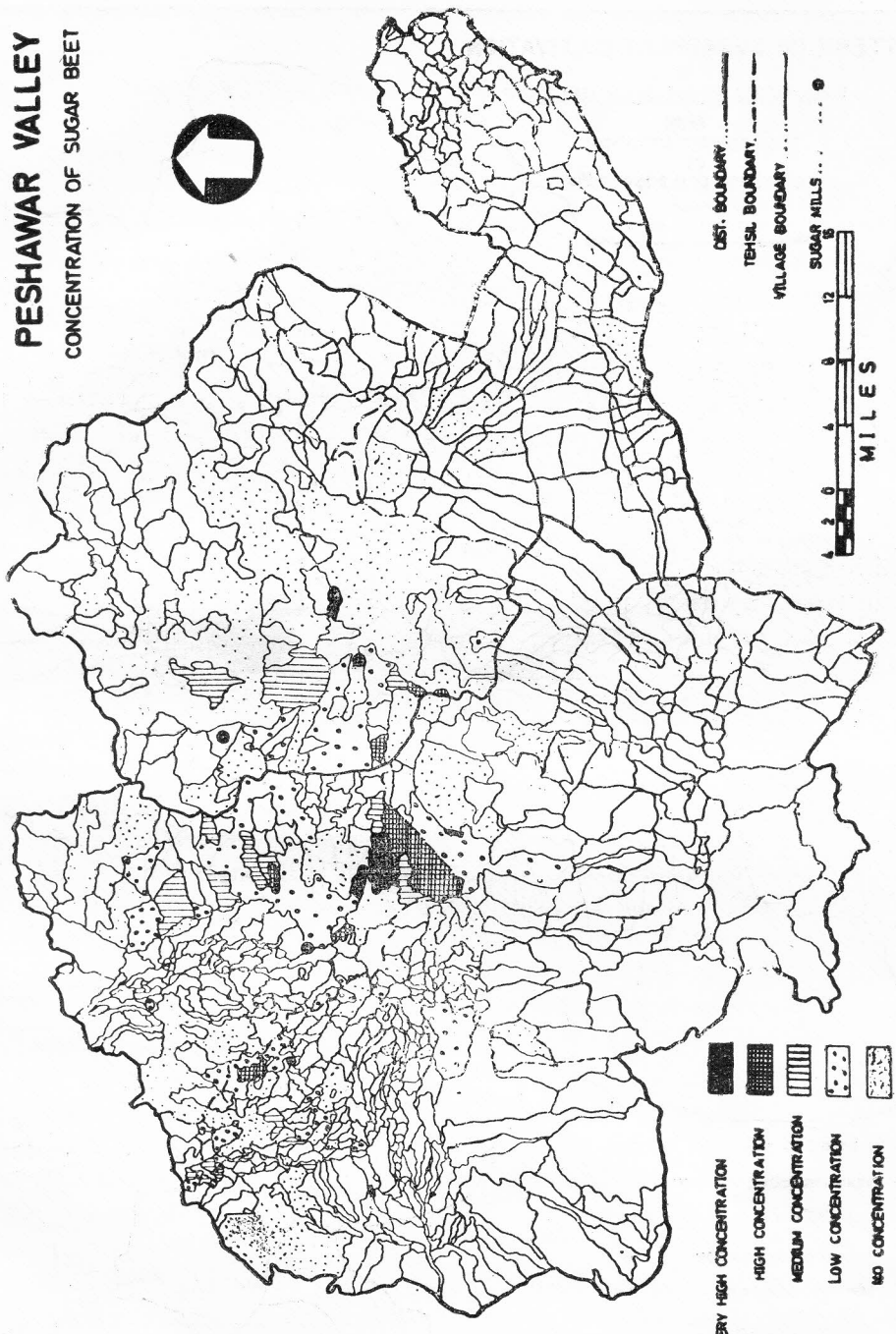
The Culture of sugarbeet started at very remote period. Beet root was a common article of diet in Egypt as far back as the building of the great pyramid of Cheops, on which Herodotus read an inscription giving the money value of the beet roots eaten by the labourers who built the pyramid[4].

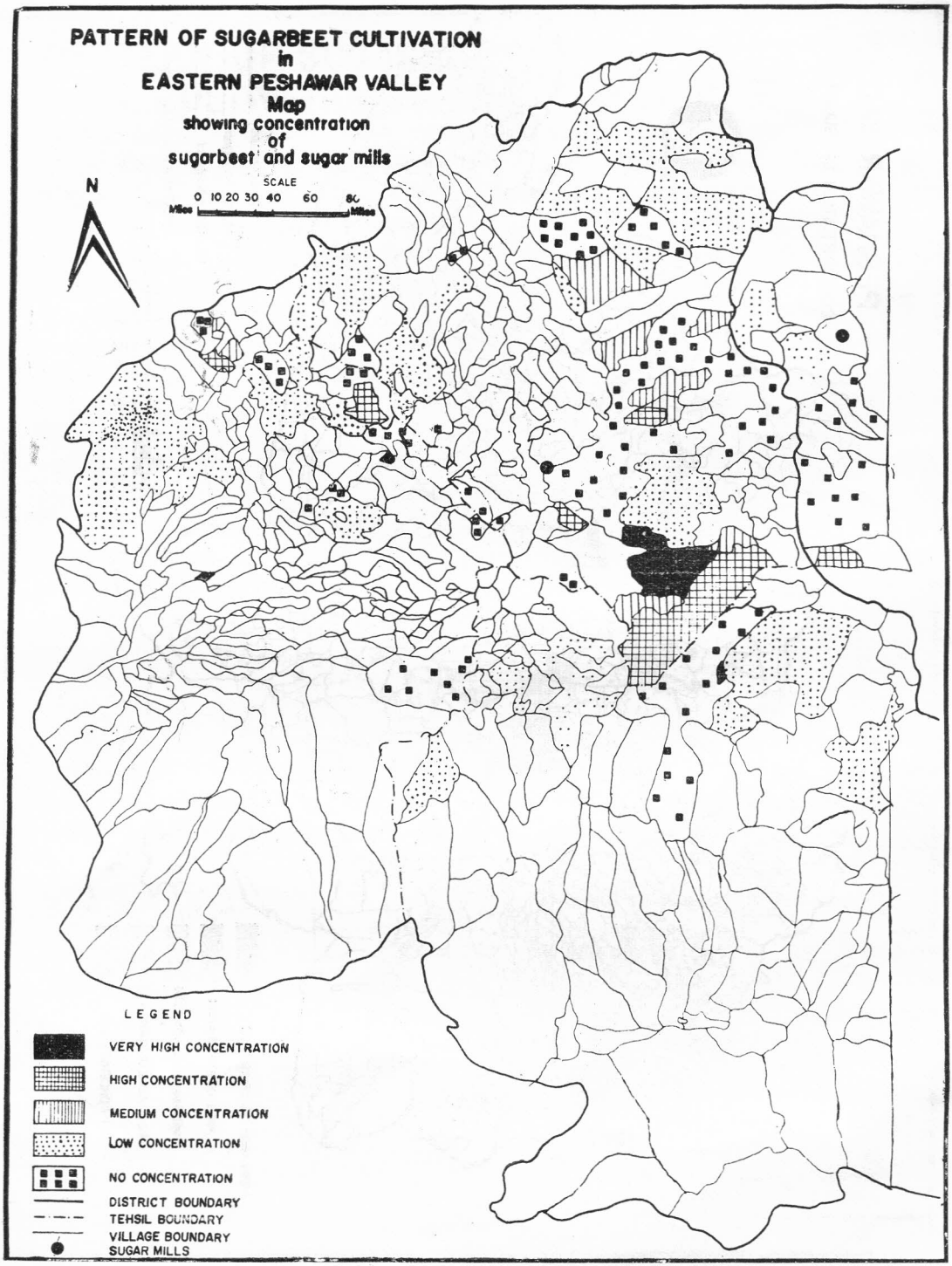
Sugar in beet roots was first of all discovered by a German Scientist Andreas Marggraf in 1747 and one of his students, Franz Karl Achard obtained a fair amount of sugar from the sugarbeet in 1799. With the help of Frederick Wilhelm the King of Prussia, first partially successful beet-sugar factory was established at Cunern, Silesia in 1803[5].

The French had been following the development closely. Their interest in these ventures was intensified during the Napoleonic war, when the English blockade cut them off from their imports of West Indies cane sugar. With the encouragement and help of

Muhammad Yaqub Alizai, Deputy Director (Physical Planning) N.W.F.P.


PATTERN OF SUGARBEET CULTIVATION in PESHAWAR VALLEY
Map showing (Field study area)
KASHMIR
Mastuj River
Chitral
Chitral River
Kalam
AFGHANISTAN
Dir
Swat
Kaghan
Saidu
Malakand
Jalalabad
Kabul River
Mohmand
Mardan
Abbotabad
Peshawar
Nowshera
Parachinar
Kohat
River Indus
PUNJAB
North Waziristan
Bunnu
South Waziristan
D.I.Khan
BALUCHISTAN
LEGEND
Field study area
Provencial boundary
District boundary
Tehsil boundary
Road
River
Urban center
SCALE
50 40 30 20 10 0 25 50
Miles


PESHAWAR VALLEY
CONCENTRATION OF SUGAR BEET
VERY HIGH CONCENTRATION
HIGH CONCENTRATION
MEDIUM CONCENTRATION
LOW CONCENTRATION
NO CONCENTRATION
DIST. BOUNDARY
TEHSIL BOUNDARY
VILLAGE BOUNDARY
SUGAR MILLS
MILES


PATTERN OF SUGARBEET CULTIVATION
in
EASTERN PESHAWAR VALLEY
Map
showing concentration
of
sugarbeet and sugar mills
N
SCALE
0 10 20 30 40 60
Miles
Miles
LEGEND
VERY HIGH CONCENTRATION
HIGH CONCENTRATION
MEDIUM CONCENTRATION
LOW CONCENTRATION
NO CONCENTRATION
DISTRICT BOUNDARY
TEHSIL BOUNDARY
VILLAGE BOUNDARY
SUGAR MILLS

Napoleon, sugar beet industry very rapidly developed in France[6]. Improvement in seeds and processes of sugar making from beet helped in the introduction of this crop in other areas of the World.

Sugarbeet is a temperate region crop but because of its wide adaptability, it is also commercially successful out side the temperate region. Under the sub-tropical conditions it was first tried in California and Spain[7]. The peculiar characteristic of adaptability in sugar beet prompted the agricultural scientists to experiment it at Tarnab form (Peshawar), 34° N and 70°E. The experimental work was started in 1912 by W.R. Brown, an agricultural officer of the N.W.F. Province. He even at that time had stated that beet of good quality can be produced in Peshawar Valley[8]. In 1920, the Indian Sugar Committee declared that the future of the sugar beet in India lies, if any where, in the NWFP and that a unique opportunity existed for combined cane and beet sugar factory in Peshawar Valley. This idea was exploited by the Department of Agriculture and full fledged research work on sugarbeet was started from 1951, and it was concluded that sugarbeet can be grown commercially in Peshawar Valley.

It was stated that climatically this region is more favourable for beet cultivation than cane cultivation. Sugarbeet can fit in the cropping pattern of this area in such a way that it would not only be more economical and profitable but it is such a crop in which Pakistan can compete with the most important producers in the world[9].

It was with this background that in 1958 the cultivation of sugarbeet started in Peshawar Valley. That year only 16 acres of land was planted to beet. The result was very encouraging. In 1959, a beet extraction plant was established at Charsadda Sugar Mill with the view to manufacture beet sugar. Area under sugar beet increased very rapidly and all the three existing sugar mills established beet extraction plants. A new sugar mill under construction in Peshawar Tehsil will also have beet extraction plant. The rapid increase, as is obvious from the Table I, took place in spite of the traditional reluctance of the farmers to take the risk of cultivating new crop. Along with the climatic and soil suitability the existing industrial, agricultural, social, and economic conditions in the Valley greatly helped and encouraged beet cultivation.

TABLE 1. *Area Under Sugarbeet in Peshawar Valley* (1958-1973)*

Year	Area in acres	Year	Area in acres
1958-59	16	1959-60	1442
1960-61	5084	1961-62	5260
1962-63	5738	1963-64	10124
1964-65	11406	1965-66	11406
1966 67	12073	1967-68	17059
1968-69	26996	1969-70	27329
1970-71	Nil	1971-72	11056
1972-73	7954		

*Revenue Records and Office of the Director of Agriculture NWF Province.

Sugar mills were already present in the area. A very large part of the equipment in the cane sugar factories could be used for the manufacture of beet sugar. The addition of beet extraction plant was not very expensive, so, as soon as the beet was available, the mills could easily make arrangements for its consumption.

Cattle being an indispensable part of every farm. sugar beet was preferred by the farmers because it is not only a sugar crop but a fodder crop as well. Its leaves, crowns and palm make a very good feed for animals. This fodder is valuable because at the time of harvesting beet (May—July), there is generally a scarcity of green fodder. It has been estimated that only the by—products from an acre of beet provide as much feed as the total yield of an average grain crop or other fodder crops.[10]

Sugarbeet requires about half the total quantity of irrigation water required by sugarcane. It is a rabi crop and requires irrigation water when it is least needed by other crops. While, sugarcane needs irrigation when it is needed by maize, rice, vegetables and other crops. Sugar beet is totally frost resistant crop and can do well even under slight saline conditions.

Beet crop is ready for harvesting when sugarcane is nearly finished. Thus it prolongs the working period of sugar mills by about two months. Besides supplying sugar, it reduces unemployment and under-employment in the area. Sugar beet requires about 7 months to mature as compared to about 12 months required by sugarcane, and can easily be followed by an other crop. In the case of Peshawar Valley sugar beet and maize combination has proved to be very suitable.

Beet is a very tender crop and requires well attended weeding and hoeing operations during the first 3-5 months. These processes should preferably be done with hand. It is important to note that hand work is needed in the months of December and January when frost is a common phenomena in the Valley. The landless tanents of the area provide cheap labour for all these processes.

Net earning from sugar beet is considerably higher than all other crops. This is in spite of the fact that the farmers are not fully acquainted with the agronomy of sugar-beet. They have inadaquate knowledge of the seed—bed preparation, the time of plant-ation, thinning, method of irrigation and harvesting.[11]

The Table 1 shows that an irregular increase and even decrease occurred during certain years. The practical absence of sugarbeet during the year 1970-71 is very striking. To understand this situation it must be noted that the sugar mills have a direct control over the production and marketing of sugar beet. They are the only agencies which distribute seeds and purchase the sugar be t. As the seeds are imported with the cooperation of the government and the price of the sugar beet is also decided by the Government, in the cultlvation of sugar beet, the farmers, the mills and the government have equal responsibility[12]. The role of the government is more important because in time import of seeds is the basic requirement and it is on the price that the farmer decides whether he should cultivate the beet or not. Because of the unstability of the government during 1970-71, sugar beet was not cultivated at all during that year. The set back to sugar beet cultivation was so serious that it has not recovered yet.

So far as the distribution and concentration pattern of sugarbeet is concerned, it has been analysed with a view to bring out an areal concentration. In studying the agricultural distribution, geographers have frequently made use of techniques involving a ratio between two units of measurement in the same area, as for instance, the ratio of cropped area to total area or the ratio of wheat area to cropped area in the are l unit. The maps prepared from such ratios do give an idea of the variations in the density distribution being in estigate l but they do not suggest how the density in the component areal units compares with the density in the area under study. For example in investigating the distribution of wheat in a region, it is of interest to know how the ratio of wheat area to cropped area in the various component areal units compares to similar ratio for the entire region. This may be called the spatial concentration of wheat in the region.

Such an approach is particularly important in the case of sugarbeet in Peshawar Valley, because of two reasons Firstly, as a whole only 3.3 per cent of the total cultivated area is under beet. Secondly, density variations are drastic. For instance in the village Maira Katchori of Peshawar Tehsil, only .007 per cent of the cultivated area is under sugar beet while, in the village Taus Banda of Mardan Tehsil, sugar beet is cultivated over 50 percent of the total cultivated area. Under this condition simple ratios do not give accurate picture of the importance of sugar beet. So, the ratio of area under sugarbeet to the total cultivated area in a village must be considered in relation with similar ratio for the valley as a whole. This technique is not new but makes possible to measure the spatial concentration of sugar beet objectively and to differentiate areas that have some significance with regard to sugar beet distribution in Peshawar Valley. Similar methods were used by Bhatia[13] and Alizai[14] but the areal units used by them (Districts and Divisions) are too large to give precise results. While. in this study a revenue village has been taken as the basic unit and to determine the regional concentration of sugar beet in Peshawar Valley an index[15] has been calculated. If the index value is greater than unity, the village accounts for a share larger than it would have had if the distribution were uniform in the entire area, where sugar beet is cultivated, and therefore, the village has a concentration of sugar beet distribution.

The values for density of sugar beet in all the villages show that concentration are then put in an ascending array and divided into four equal parts to distinguish low, medium, high and very high degree of concentration. The following table shows the ranges of concentration and those of corresponding ratio of sugarbeet area to total cultivated area.

S. No.	Intensity of Concentration	Range of Concentration	Range of the ratio between sugarbeet area and total cultivated area.
1.	Low Concentration	1—3	3.3%—10%
2.	Medium concentration	3—6	10%—20%
3.	High concentration	6—9	20%—30%
4.	Very High concentration	Above 9	Above 30%

The map (Fig. 2) based on these concentration Indexes is revealing. In geographic classifications, the accuracy to a very great extent depends upon the areal unit used. An analysis of the agriculture of a region cannot be too meaningful if carried out for relatively large territorial units. Smaller units with homogeniety of their agriculture, must therefore be taken as the elements. Village is a fairly small unit to give precise results. In fact it is impossible to go beyond village level and cover such a large area as Peshawar Valley. This can be better appreciated by noting that the number of revenue villages in the valley is 900. Besides making culculations for each of these villages, they had to be accommodated on a map of manageable size. The village boundaries were first drawn on tehsil maps and then these tehsil maps were joined together. The village boundaries were drawn with the help of revenue department maps. Such maps are not very accurate. Because, they are drawn by unskilled employees of revenue department. To make corrections in the boundaries of these maps, they were compared with topographic maps. Slight adjustment had to be made in the boundaries of the villages lying along tehsil boundaries. As these changes were made on one inch to a mile maps, which when reduced to the extent they appear in this paper, the effect on area and shape should be neglegible.

The patterns as appear on the map are interesting. Their interpretation involves many physical, economic, cultural and administrative factors. Cultivation of sugar beet in the middle, north and north-West and its absence from rest of the valley is very striking. Irrigation intensity and the proximity to the sugar mills are mainly responsible for this. In south-west and west of Mardan Tehsil, almost whole of Charsadda Tehsil and north-east of Peshawar Tehsil, ratio of irrigated area to cultivated area is very high[16]. In fact all the villages where beet is cultivated have very high irrigation intensity. This is what it should be, because, in the climate of Peshawar Velley a tender crop like sugar beet cannot be cultivated without irrigation. The distance from sugarmills is also a very important factor. Generally sugar beet is cultivated within a maximum radius of 15-16 miles from a sugar mill[17]. This is because, the mills are the only market for sugar beet and with distance transportation cost increases while sugar content decreases.

Regional variations in the degree of concentration of sugar beet within the area where sugar beet is cultivated is remarkable. There are two areas of very high concentration. The largest area of very high concentration and high concentration is located in the south of Tehsil Charsadda. The villages of Maira Nisatte and Najmabad show very high concentration. About 33 percent of the total cultivated area in these villages in under sugar beet. The adjoining villages of Bubak and Dheri Zardad show high concentration. About 20 percent of the total cultivated area of these villages is under sugar beet. The concentration pattern is very interesting and does not show accordance with irrigation intensity or the distance from the mill. As seen earlier, in the areas having similar irrigation intensity villages closer to the mills should have higher concentration of sugarbeet. But as obvious on the map, the areas in the north of Maira Nisatta and Najimabad have either low concentration or no cultivation at all, as in the case of Ibrahim Zai and other adjoining villages. The most important reason for this is the fact that the villages showing very high

and high concentration are lower ripartians and do not get enough irrigation water during Kharif season. Because at that time most of the available irrigation water is utilized in the upper riparian villages for sugarcane and other crops. As the sugarcane requires a lot of water during Kharif season so its cultivation is much less in the lower riparian villages. During Rabi, quantity of water required by crops in upper riparian villages is less so enough irrigation water is available for sugarbeet cultivation in the lower riparian villages[18]. It means, sugar beet is more important in those areas where conditions are less favourable for sugarcane. Sugarcane is preferred in spite of the fact that sugar beet is more paying, because of the inefficiency of mills in picking sugar beet in time, and long time taken to negotiate the price of sugar beet and availability of seeds. The farmer can made gur from sugarcane which may be more paying. So, where there is a more sure supply of irrigation water a farmer will give on y a fraction of his farm to beet to get green fodder when it is badly needed and also he will be getting some money when his sugarcane is finished. The tenants and farm labourers are also happiest this way because they too get their share for a longer time. Hard work specially finger work needed in thinning and horing of sugar beet during the months of December and January when frost is common, is also a factor which limits the cultivation of sugar beet[19]. This factor is more obvious in the case of village Taus Banda, Mardan, which is the second most important area as for the concentration of sugar beet is concerned. Here the concentration is not only very high but the highest with about 50 per cent of the cultivated area under sugar beet. In this village most of the farms are of medium size and are owner opperated[20].

An owner cultivator puts in maximum hard work because he himself receives all the fruit of his hard work. Other small areas with higher concentration like vi lage Khatki and Chalghazi, Peshawar and some in Charsadda and Mardan can also be interpreted with reference to the same factors. However, more research is suggested to interpret the pattern complet ly.

It appears that if the patterns of sugar beet concentration are compared with similar patterns for sugarcane, an optimum combination can be worked out. This would ensure the most economical use of irrigation water and would be equally benificial to the cultivators, labourers and mill owners. Such studies can also help in the future planning for this area. Because in predominently agricultural regions, a fundamental, preliminary step to planning is to acquire precise knowledge of the structure of agriculture as well as of its possible and probable development.

Rcferences and Notes

1. Narrow plaints along the foothills of northern and western mountains are structurally part of Peshawar plain but they have been excluded from this study. because, neither the data is available nor sugar beet is cultivated in that area.
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13. S. S. Bhatia, Patterns of Crop Concentration and Diversification in India economic Geography, Vol. XII January 1965, pp. 39-56.
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15. *Concentration Index* =

$$\frac{\text{Area under Sugarbeet in a Village}}{\text{Total cultivated area in the same village.}} \quad \frac{\text{Area under sugarbeet in all villages.}}{\text{Total cultivated area in all the villages where sugar beet is cultivated.}}$$

16. Dichte r op cit., fig 14.
17. Personel communication with Beet Botantst, Ternab Agriculure Institute, Peshawar.
18. Field survey and interview with the farmers of this area.
19. Personel interview wlth the farmers.
20. Revenue records of the office of Tehsildar, Govt. of N.W.F.P. Mardan.

WHAT CONSTITUTES A VALID GEOGRAPHIC RESEARCH

MOHAMMAD M. KHAN

The quantitative revolution[1] of 1960s has implied a philosophical reorientation in geography. We (geographers) have started thinking logically and consistently and using standard scientific techniques in geographic research. Geography for a considerable time did not have any significant theoretical base. This lack of theoretical base was mainly because of lack of explanation. For "the quest for explanation is a quest for theory".

In geography we have been developing theories, which though stimulating and exciting, were scarcely capable of verification. This can be attributed to two reasons :

(1) The use of very weakly linked methodology. (2) Incapability of these theories to undergo deductive elaboration. Davis puts it in another way: 'Geography has been suffering from misuse of imagination, invention, deduction, and various other mental faculties that contribute towards attainment of an explanation'. He further says : 'To exclude from geography the theoretical half is like walking on one foot or looking through one eye'.

In a scientific explanation, generally there are three terms used, theory, law or hypothesis and model. Theory in Einstein's words is a free creation of the human mind. A speculative theory does not necessarily possess the status of a scientific theory. A scientific theory according to Ramsey, is a language (Calculas) for discussing the facts a particular theory is supposed to explain. It has a domain, the extent of which varies according to the terms within the structure of the theory.

A scientific law at the same time may be interpreted as a generalization which is empirically (universally) true and also a part of a theory. A scientific model on the other hand is a framework for idealization of theories.

The interaction between theories, laws and models gives rise to modification and validation of theories. This interaction in geography has been a short distance behind other social sciences. The reasons apparently were :

1. Delayed adoption of standard scientific techniques.[2]
2. Greater emphasis on the theories borrowed from other disciplines.

Most of our efforts to study the relation between theory, law and model still assume that we use an existing theory, for example, Harvey[3] discusses this relationship assuming that an existing theory T, a law L or hypothesis H, if tested by a model M may give rise to a modified theory 'T (e. g. T, L or $H \rightarrow M \rightarrow T$). This author suggests that we start from observation O and then follow T, $H \rightarrow M \rightarrow {}'T$.

The use of a sharp tool like mathematics in geography has made it possible to tackle difficult problems of model building. Apart from the Calculas being one language for explanation in geography, we have an advantage of using geometry (cartography) as another.

But is cartography (or map) such a special language? Would its analysis lead us to new discoveries in the logic or languages? The use of computers for mapping has made it possible to transfer the geometry of maps into mathematically interpretable language and *vice versc*. Some geographers like Hagrestrand, Olsson, Tobler and Binge have already broken the traditions of Euclidian geometry. All these developments have lead Binge[4] to claim that maps constitute a subset ot mathematics. This author stronlgy feels that it would increase the market value of geography if we head towards mathematical theory of maps.

At present it is much easier to give explanation of a geographic phenomenon in clear cut manner than half a century ago. But still a lot of work is being done at conceptual level, which is of little practical utility. It is high time that we shift our emphasis from theoretical to applied geography. A valid geographic research, in the opinion of this author, is that which has its practical utility and which increases the market value of the subject.

References and Notes

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THE ROLE OF GEOGRAPHY IN ASCERTAINING* THE TELECOMMUNICATION PATTERN OF PAKISTAN

ABDUL HAMID KHAN†

The validity and significance of telecommunication needs no explanation. It is only the telecommunication factor, which has brought the world closer. No part and place on the earth is outside its reach. In this 'Space Age' that we live in, it was only the telecommunication, controlled from the ground, which brought the spacemen at the surface of the moon. Thus, it may be the daily life of a common man, playing of commercial centres or the running of Industrial concerns, maintaining a smooth governmental administration or retaining constant 'International Relations, during peace or at times of troubles, the importance of telecommunications can never be underestimated.

BRIEF DESCRIPTION OF TELECOMMUNICATION SYSTEMS

Telecommunication means "to communicate with the distant end" by any means. Before these more complicated and sophisticated instruments of today were invented and introduced, the people used to talk from one station to another through the overhead lines between these stations. One pair of line could facilitate only "one party" at each side, while others had to wait till the end of the talk of the first party. In this way, people had to wait for days together for their turns.

With the passage of time, the Carrier Equipment, in use today was introduced. As the name suggests, this equipment carries the voices of the people from one end to another through a single pair of line. The maximum limits of the parties which can talk with the help of carrier equipment at the same time is twelve. Although, the introduction of carrier equipment provided greater facilities, yet these all proved to be insufficient for the fast developments in the fields of trade, commerce and industries.

Thus more efficient and far more facilitating Coaxial Cable System was introduced. Coaxial cable means a cable which accommodates conductors with two axes. These conductors are copper tube and rod separated by polythene disc to prevent short circuit. These conductors act as a pair of line and are well protected in the cable. They are wrapped with papers, aluminium covering, steel armouring, impregnated jute and at the top with rubber to retain flexibility in the cable. This cable runs below the surface of the ground from 5-7 feet, connecting the desired stations. The system worked by this

*Views and opinions held by the author in this article are entirely his and not that the Publisher.

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cable can carry 960 voices at the same time from one end to another. The direct dialling facilities enjoyed presently by some of the bigger cities is through the same system.

The main problem with this system is that it cannot be worked in the hilly areas because of the difficulties faced in laying the cable. To overcome this difficulty, microwave system was introduced which does not need any physical line or coaxial cable. The atmosphere acts as a media of communication as in Wireless System.

The two microwave stations have microwave equipment plus a huge tower with a concave mirror type big plate at the top of the tower. These plates of the towers transmit and receive Electromagnetic waves, in which travel the same number of voices as in coaxial system *i.e.* 960 voices, even upto 9603 if required.

This microwave system is particularly important and useful in the hilly areas where the physical lines cannot be maintained properly or the cable cannot be laid due to irregular hard terrain. Direct dialling, and the television programmes can be run simultaneously through this system. Presently this microwave system, in collaboration with satellite, can facilitate us to watch programme of a distant country. Wireless communication is also an important organ of telecommunication though it provides very few simultaneous speech facilities.

Let us see the extent of role of Geography in shaping the telecommunication pattern of Pakistan. Some of the geographical factors which effect telecommunications are :

1. Physiographical Aspect.
2. Climatological Aspect.
3. Economic Aspect.
4. Geopolitical Aspect.
5. Historical Aspects Related to Geography.
6. Social and Cultural Aspect.

For our present discussion, first four aspects are of great significance and the impact of these aspects in ascertaining the telecommunication pattern of our country shall be discussed.

Physiographical and Climatological Aspect.

Fortunately, Pakistan enjoys nearly all types of physiographical features and different types of climate. We have the coldest regions in the north and hottest in the south. Similarly, we have the highest mountain ranges in the north, northwest, low-height ranges in the middle-west, plateau on southwest and the plains in the east.

Taking the extremities of climate in the north, we observe that all the high mountain ranges are either covered by snow or glaciers through out the year. The height of 26660 ft. is reached at Nanga Parbat while 25230 ft. at Tirich Mir mountain ranges. The dimension of snow and glaciers is increased in the winter season over these hills and their prong is further extended southward encircling Nathiagali and Murree Hill tracts. Similarly, the north western ranges of Baluchistan also receive snow fall during extreme winters.

As the northern high hills are traversed downward to the south, they are reduced in height, and range between 8000 ft. to 20,000 ft. in Swat, Hazara, Dir and lower Chitral. These hill ranges are further reduced in height when they penetrate the middle and south western sections of N.W.F. P. ranging from 3,000 ft to about 8,000 ft.

Again, further south to Baluchistan plateau, except for few sites in the northern part, where the hills reach to a height of above 12,000 ft , most of the area is covered by low hills ranging from 3,000 to 8,000 ft.

Thus if we draw a line dividing Pakistan into two parts approximately running parallel to Indus River we can observe the clear separation of hills and plateau in the north, north west and the plains in the east, south east.

If we have a look at map No. 1 and see the main links of telecommunication, there will be no difficulty in reaching the conclusion that nearly all hill tracts in the north, south western N.W.F.P. nearly all Baluchistan except Quetta proper is out of the reach of efficient and quick telecommunication facilities. The line that you see on this map from Karachi *via* Quetta to Tehran is the R.C.D. microwave link up, which although travels a long complicated route through Baluchistan yet facilitates none of its important parts except Quetta. This link up is otherwise purely for onward communication with Tehran and Ankara etc.

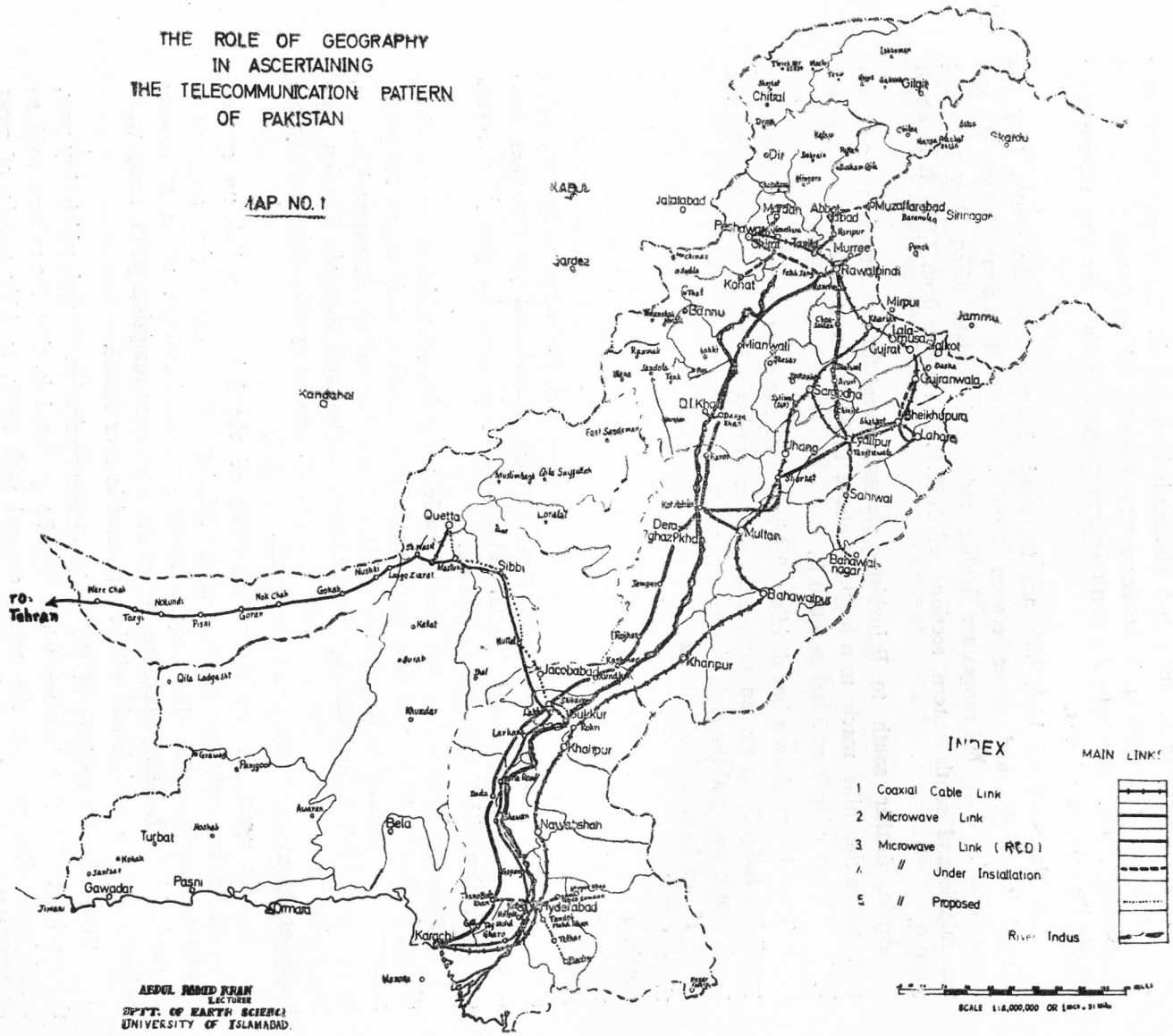
Secondly, if we follow the coaxial cable route through which the present direct dialling is effective, we observe that nearly whole length of this cable is within the plains starting from Karachi to Rawalpindi *via* Hyderabad, Nawabshah, Khairpur, Khanpur, Bahawalpur, Multan, Sargodha, Lyallpur, Lahore, Gujrat and then *via* Kharian upto Rawalpindi and Taxila. The only parts of N.W.F.P. covered by this cable recently are Peshawar, Mardan and Haripura from Taxila. (Fig. 1)

Thirdly, again, if we follow the route of the Microwave link up system, we come to the only conclusion that it follows approximately the same route parallel to coaxial cable. The only fortunate part of N.W.F.P. where microwave has reached is D. I. Khan, where the eastern section mostly comprises plain area, while Peshawar and Kohat, it is said will be connected in near future.

Thus after the analysis of the main telecommunication through which they pass, the result at the first instance which can be gathered is, that the extreme cold, so called inaccessible parts of the north, covered with snow, to hilly terrain of most of N.W.F.P. and nearly whole of Baluchistan has strongly restricted the efficient telecommunication network to penetrate west ward. However, these sections are not

THE ROLE OF GEOGRAPHY IN ASCERTAINING THE TELECOMMUNICATION PATTERN OF PAKISTAN

MAP NO. 1



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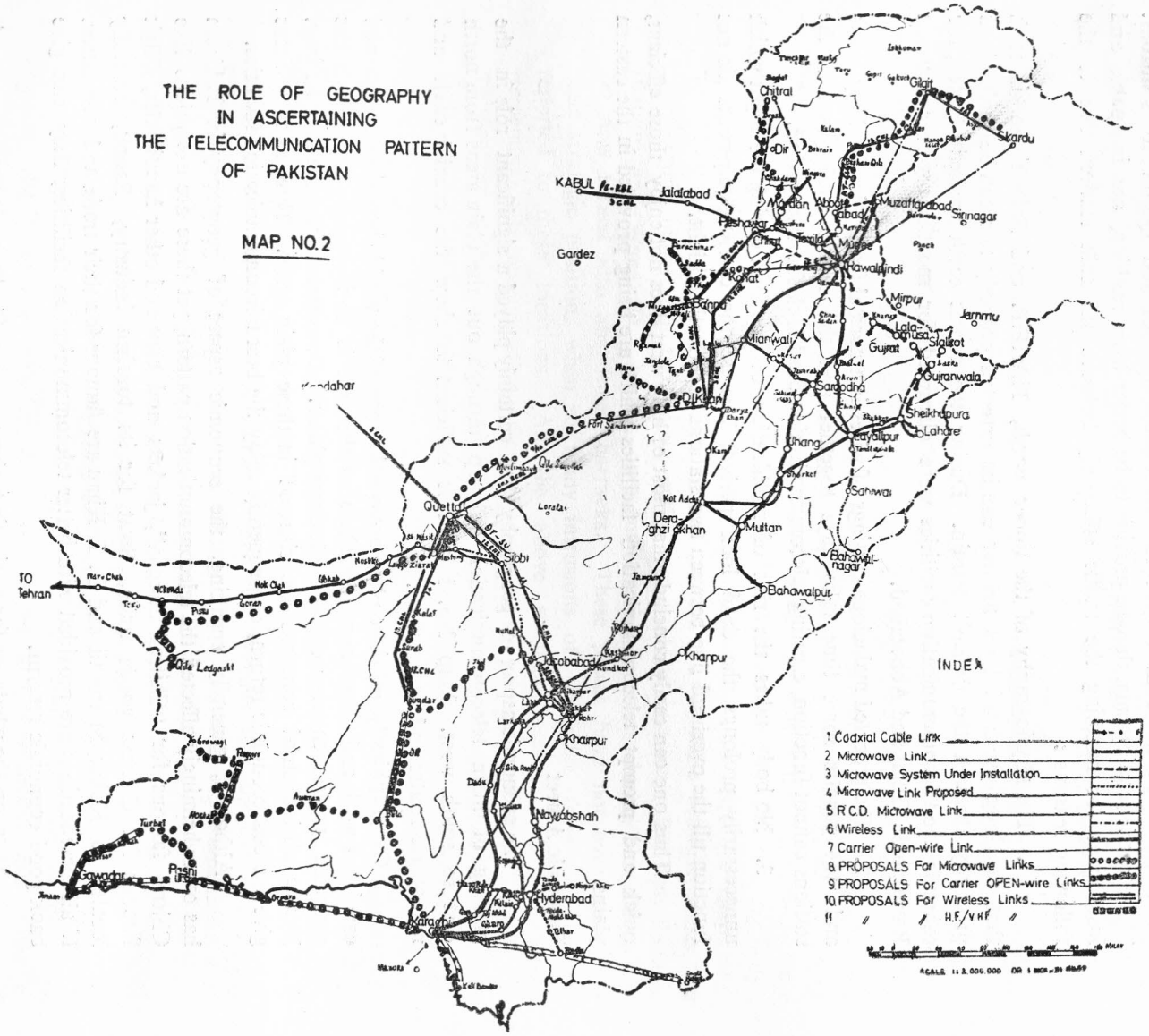
THE ROLE OF GEOGRAPHY
IN ASCERTAINING
THE TELECOMMUNICATION PATTERN
OF PAKISTAN
MAP NO. 2
KABUL
Jalalabad
Chitral
Gilgit
Skardu
Dir
Mardan
Abbottabad
Muzaffarabad
Srinagar
Peshawar
Kohat
Taxila
Murree
Rawalpindi
Gardez
Mirpur
Jammu
Bannu
Mianwali
Lala-Musa
Sialkot
Gujrat
Gujranwala
Sargodha
Sheikhupura
Lahore
Jhang
Layallpur
Sahiwal
Quetta
Kot Addu
Dera-Ghazi Khan
Multan
Bahawalnagar
Bahawalpur
Sibbi
Zobabad
Khanpur
Kharpur
Nawabshah
Hyderabad
Karachi
Gwadar
Pasni
10 Tehran
INDEX
1 Coaxial Cable Link
2 Microwave Link
3 Microwave System Under Installation
4 Microwave Link Proposed
5 R.C.D. Microwave Link
6 Wireless Link
7 Carrier Open-wire Link
8 PROPOSALS For Microwave Links
9 PROPOSALS For Carrier OPEN-wire Links
10 PROPOSALS For Wireless Links
11 " " H.F./V.H.F "

completely neglected. The carrier equipment do operate through overhead lines in some parts, for example, Abbottabad to Gilgit, D. I. Khan to Bannu, Bannu to Peshawar *via* Kohat, D. I. Khan to Quetta *via* Qilla Saifullah and Muslim Bagh in N.W.F.P. while they operate from Quetta to Jacobabad *via* Sibbi and Quetta to Khuzdar. These carrier equipments, though proving to be better than nothing, are incapable and insufficient for handling the traffic effectively between the said stations due to the following reasons :

1. The Physiography of the upper north, N.W.F.P. and Baluchistan, is such that the long overhead lines neither can be errected properly nor can be maintained promptly through the difficult terrain. During the recent earth quake in Patten, for example, the telecommunication facilities were disrupted for months together between Rawalpindi, Gilgit and Abbotabad.

2. The repeated malacious cuttings of wires is a normal feature in the hilly areas and the repairs some time take days together and the carrier equipments at the stations cannot function, creating telecommunication dead lock for that period.

3. No body takes the risk of rectification of line fault during the night which unnecessarily prolongs the dead lock period, because the carrier equipments do not function till the overhead line between two stations is perfectly alright.

Thus one can easily conclude that most of hilly west does not enjoy those efficient, quick and prompt telecommunication facilities which are being provided in the eastern plains.

Economic Aspect

The economic aspect of geography has certainly played a significant role in the making of main telecommunication link up through out the plain areas from north east to south west. Map No. 1 itself is sufficient to show the coaxial cable and microwave routes and connections.

Geographically, all these plain areas enjoy one of the worlds best river system and canal ,net work and therefore nearly whole of the area is agriculturally rich which has attracted greater number of people to these plains. Commerce and trade is at its best. Nearly all industrial concerns are situated in these plain areas. Thus, as these areas give the best economic return, consequently enjoy the best telecommunication facilities.

Although, generally speaking, the economic aspect of geography in Pakistan has overwhelmingly affected the telecommunication pattern, yet there are exceptions like Chitral famous for "Chitrali Chogha", jackets and caps and other handicrafts, Gilgit famous for Chinese goods trade, Swat for its tourism industry, Bannu, centrally located to Kohat, Mianwali and D. I. Khan are famous for their trade and commerce. If all these stations are provided with better telecommunication facilities, they can give back good economic returns.

Thus, on the whole, as for as the first three geographical aspects are concerned, they have greatly affected the telecommunication pattern of Pakistan.

Geopolitical Aspect

This aspect of Geography excels all other aspects and is more fundamental in the development and safety of any nation. If the security of the country is at stake, then all the progress and development schemes automatically become secondary issues. Unfortunately, this aspect of geography has miserably failed to produce any change in the telecommuication pattern compared to the former three aspects.

Now let us look at our country. The border in the north and north east has always remained a hot zone right from the time Pakistan appeared on the world map. The intrusion of the Indian planes at low flights from Srinagar and other southern air bases, penetrating our country from north and north east and attacking our air bases always remained a problem during the two wars with India.

No one can underestimate the historic importance of the passes in the N.W.F.P. It is a historic truth that the passes at Khyber, Kurrum, Tochi and Gomal have always guided the western invaders to the areas where we live today. But the glance over map No. 1 will show a very poor attention being paid to these sensitive pockets. The importance of Landi Kotal (Peshawar) is known to every body ; Parachinar (Kohat) known as the Murree of N.W.F.P. has its own attractive characteristics, Miranshah (Bannu) is a known timber market. Thus these sensitive zones are of economic importance too, along with their strategic location. The cool Razmak (Bannu) and Wana (D. I. Khan), once military headquarters during the British rule are now turned into abandoned barracks. These places have not even now lost their strategic position, when so many intrusions of 'Pavindas' from the west are reported to these locations. All the above strategic locations are now facing tremendous telecommunication difficulties at the hands of overhead lines, though the maintenance expenditure of these lines is far greater than the cost of more convenient H. F. (Hinh Frequency), and V.H.F. (Very High Frequency) equipments which can be operated in these areas.

Although some of these areas are connected with the carrier system at Miranshah and physical overhead lines at other places, yet unfortunately these lines cannot be maintained properly due to the difficult hilly terrain and occasional malacious cutting of these lines.

To communicate with the North we do have wireless link up from Rawalpindi Gilgit, Rawalpindi Chitral, Rawalpindi Skardu and Peshawar, but the equipment used for the purpose is old and the efficiency is poor.

In Baluchistan, it is well-known that the smuggling including men and material from a long coast West of Karachi, covering sites of Ormara, Pasni, Gwadar and Jiwani is carried out. How the smuggling of material and men injures the economy of a country needs no explanation. But since the creation of this country, no effective check to this practice has been undertaken. Secondly, this coast is always open to any of the malicious and antinational activities from abroad and from within. We do have a partime wireless communication with the sites mentioned

above, which does not serve the purpose and is often found faulty which renders the service useless.

Similar is the case with the coast east-west of Karachi in Sind Province where even the so called wireless is absent altogether and thus is not guarded properly.

From these few geopolitical aspects of our country one can easily conclude how lightly these aspects have been taken in respect of good telecommunication link up.

Before suggesting for improvement of telecommunication facilities, it would be proper to pinpoint one unhealthy tendency regarding the establishment of telecommunication facilities. Uptil now only that locality of the country is provided with these facilities where the people cry for them or the political pressure from one side or another, forces the authorities to do so for that locality.

Secondly, no attention is being paid in estimating and foreseeing the economic potentiality of a particular area. For example, beside their strategic locations, given earlier the importance of Chitral regarding its handicrafts and of Gilgit regarding its Chinese goods trade, Bannu for its trade and commerce particularly wool etc. cannot be ignored. The businessmen avoid trading with those parts of the country which are not easily accessible because they cannot run so often to those remote trade centres in the absence of quick telecommunication links with that part, which are otherwise pockets of great economic returns. The best transport and telecommunication link actually gives rise to the best economic development of that area. If the telecommunication facilities are provided earlier before economic development efforts, this will give a trigger effect to the speedy exploitation of economic potentials of that area.

Same can be very much true in the case of Baluchistan. The governmental and private engaged enterprises in the oil exploitation in Baluchistan with foreign experts have repeatedly indicated regarding rich oil reserves underneath the soil of Baluchistan. Sui Gas is the result of such exploitations long ago and many other efforts have proved fruitful.

But as the telecommunication link through out Baluchistan is very poor. All governmental and private companies operating there cannot communicate with their headquarters at Karachi, Rawalpindi and Quetta etc. regarding their progress and are unable to receive timely guidance from them which seriously harms and delays their work. If an efficient telecommunication network is established which penetrates deep into the interiors of Baluchistan, it will not only greatly enhance the developmental work in those areas but will also insure security interests of Pakisian.

For the purpose mentioned above, I suggest the following telecommunication link up in N.W.F.P., Baluchistan and Sind, which is the dire necessity for today and for tomorrow is suggested.

1. Abbotabad should be connected with Gilgit through microwave link and Gilgit onward with Skardu through H.F. (High Frequency) three channel link up via Astor.

2. Chitral must be linked up with Mardan through microwave via Dir and Chakdara.

3. Kohat should be linked up with D. I. Khan via Thal and Bannu (including Bannu in the nationwide direct dialling scheme).

4. D. I. Khan should be linked up through microwave with Quetta via Qilla Saif Ullah and Muslim Bagh. While H. F. 12 channel system should work between Kohat-Parachinar via Thal and Bannu-Miranshah.

5. 3 channel H. F. system should be established between Miranshah, Razmak and D. I. Khan-Wana.

6. In north western border of Baluchistan, the R.C.D. microwave link up has already provided us the marked station. Therefore, our National microwave link up must also follow the same route to cover up that boundary via Mustung-Nushki-Nokundi and Ware Chah etc.

7. Quetta-Jacobabad microwave link up must be completed earliest so that the Quetta television station is also able to broadcast the national hook ups to create a sense of participation in the national affairs.

8. If Jacobabad is connected with Khuzdar via Jhal, the maintenance length of carrier line from Quetta to Khuzdar *i.e.* in hundreds of miles, can be avoided and link up will be retained through microwave. Khuzdar can then further be connected with Karachi via Bela or an H.F. link can be established between them.

Similar H.F. links (whole time) must be established at Awaran, Hoshab, Turba down to Jiwani, Gawader and Pasni. Punjgoor should be connected with Hoshab with H.F. three channel link and the similar link up from Nokkundi to Qilla Ladgusht should be established safeguarding whole of the boundary of Baluchistan and also helping the governmental and private enterprises busy in oil exploitation within that area. Though this expenditure presently seems to be extraordinary, yet it will prove as the foundation stone for the development of the whole nation when we reach the oil reserves.

9. A full time wireless communication should be established between Karachi-Keti Bandar and Karachi-Nagar Parker *via* Badin to safeguard our coast east of Karachi-and south eastern boundary of Tharparker in Sind Province.

Presently, it is observed that the geography of our country has strongly dictated its terms in respect of telecommunication network as far as hysiographic, climatic and economic aspects of geography are concerned. However, the geopolitical aspect plus the zones of greater economic potentials have not been given due attention. This state of affair can never be conducive to the long range development of our country. Our borders must be guaranteed to be safe regarding telecommunication, irrespective of how much "Economic Return" we procure from these presently poor areas, otherwise strategically very important and highly sensitive. Although, economically we have an excuse of being a poor nation but prolonged delay in extending our telecommunication network will delay our development planes and jeoperdize our political and military interests.

ENVIRONMENTAL CONTROLS IN FARMING

Scotland—A Case-study

A. H. RATHORE*

Scotland's environmental setting is of a distinctive character in the geography of the British Isles. Each of its major physiographic divisions has certain characteristics that influence the agricultural geography of the region. There are, as a whole, definite natural cheeks on the utilisation of land making this northern part of Britain a typical representative of the cool temperate insular hilly margins of the north-west Europe.

RELIEF AND STRUCTURE

Being essentially a hill-country, elevation is the keynote in the Scottish landscape and as will be seen later, agronomy : the great mass of highland in the north separated from a sizable upland in the south by a trough of uneven surface.

(a) The Northern Highlands a complex mass of ancient crystalline highly metamorphosed rocks, is the dominant feature on the map of Scotland. High in the west, it gradually declines eastwards.[1] Structurally, the region, owes its origin to Caledonian folding. Later changes, caused by denudation, and particularly glaciation, gave it its present shape and mosaic of features. The prevelant rock types are hard compact gneisses,[2] exposed particularly in the outer Isles and parts of the West Coast, quartzite and schist. On the margins of Moray Firth formations of old red sandstone, a rock that yields good soil, prevail. The cleft of Glen More is not only a tectonic divide between the North-Western Highlands (rigid and dissected) and the Central Highlands or Grampians (more plateau-like), it also forms a boundary between two rather different patterns of man-land relationship. The physiography of this part of the country is, as a whole, marked by coarse shattered rocks that carry deep marks of glaciation. The nature of the parent rock, where exposed, and presence or absence of surface deposits predominantly glacial or fluvio-glacial, have had their restrictive impact on the scope of agriculture in the region.

(b) The Southern Uplands is another high ground area carved, as it structure suggests, out of a folded mass of Silurian[3] rock marked, in this case too, by Caledonian trend. The sedimentary formations of the region distinguish it from the northern Highlands. The region has a central core the western part of which derives its massive character from the intrusive granitic rocks. East of this core the landscape grades down into lower elevations and is of a more open character.

Except in the depressional pockets of accummulated soil, where arable farming is done on a limited scale, both the regions nourish stock farming industry on their vast

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slopes covered with heather and grass. A striking feature is that 800 feet contour marks the upper limit of organised gainful utilization of land in both. Areas between 600 feet and 800 feet contours, that for purposes of classification could be regarded as "High ground", carry coarse grasses and form sheep walks, an ideal home for the Blackface.[4] Areas ranging in elevation between 400 and 600 feet, the "Marginal high ground", with better grasses, promote mixed cattle and sheep farming. In terms of land-use, the Southern Uplands have an advantage over the north in that the region has greater proportion of land under 800 feet and relatively less severe conditions.

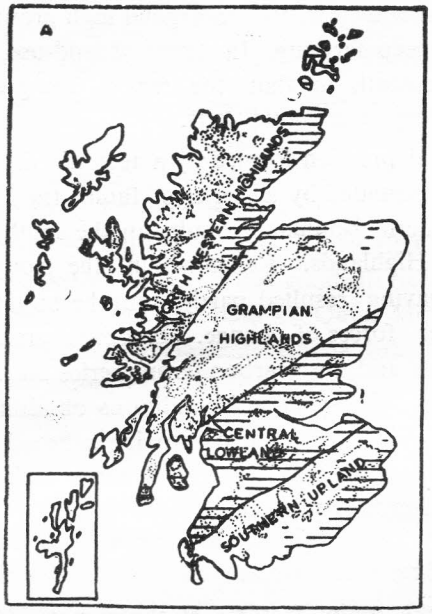
(c) **The Central Lowland.**—is a trough-like depression formed by a tectonic rift and contains the major part of lowland Scotland. Bounded by a series of faults, the Highland Boundary Fault on the north and Southern Boundary Fault on the south, the trough conforms to the Caledonian trend of the Highlands. Relief within the trough is no less complex, being a mixture of features having resulted partly from the structural changes and partly from the operation of other forces of change. Extensive areas of lowland have formed mainly on old red sandstone and the carboniferous series but these are interrupted by volcanic uplands. The greater variety of soil conditions obtaining in the belt are, thus, related to its physiographic evolution. These provide a broad base for an intensive agriculture with a well-organised system of rotation and a variety of products and invest the belt with a fairly rich economic potential.

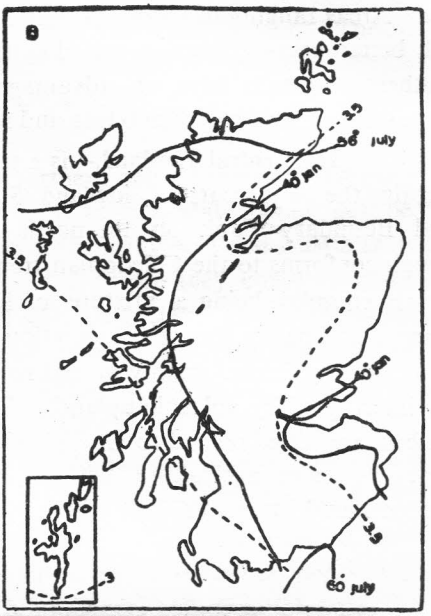
CLIMATE

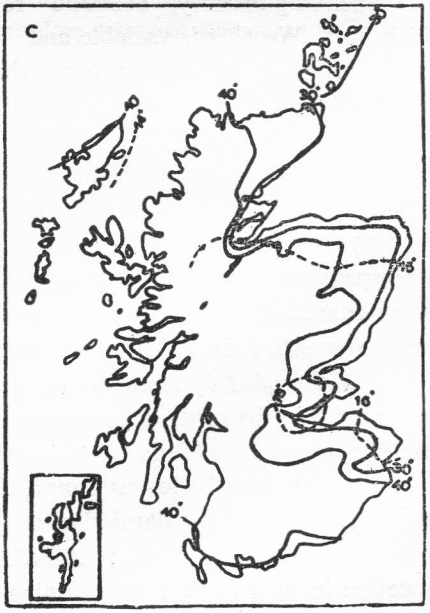
Speaking broadly, Scotland represents the main features of the climate of the British Isles. Weather is variable and is markedly affected by the relative strength of the pressure systems developing over the continent. Taken as a separate unit area, the Scottish climate shows a wide range of variations accounted for by altitude, high latitude, insularity and the North Atlantic Drift. Besides temperature and rainfall, basic variables in the making of a climate, frequency of sunshine and frost and the degree of evaporation are determining factors in the Scottish context.

(*i*) **Temperature** : The distribution of temperature in Scotland is rather anomalous for temperatures, especially in winter, are uniform for the latitude. Except for the south-eastern coastal strip, all the other parts of the country have around or over 40°F.[5] However, the position is different in summer when temperature vary from north to south. (Map 1) Although July temperatures are over 60°F over a large part of the country, the border areas in the south have average temperatures as high as 60°F. While in summer low temperatures are found in the north (54°F) for reasons of latitude, in winter it is the south-east that has the lowest temperature. This contrast with the north-west is due to the influence of warm Atlantic Drift.

(*ii*) **Sunshine & Frost** : Allied to the general conditions of temperature, but more important in their impact on farming operation in a high latitude country like Scotland, is the frequency or infrequency of sunshine and frost. In winter average daily hours of sunshine for the country as a whole are 1 to 1-5. The eastern and south-eastern seaboards have the maximum average daily duration of up to 2 hours while the Outer Isles in the







SCOTLAND
MAJOR FEATURES
OF
RELIEF AND CLIMATE
INFLUENCING AGRICULTURE

RELIEF (A) MAJOR DIVISIONS
OLD RED SANDSTONE AND CARBONIFEROUS ROCKS
800-FOOT CONTOUR

CLIMATE (B) ISOTHERMS
AVERAGE DAILY HOURS OF SUNSHINE
(C) ISOHYETS
AVERAGE ANNUAL EVAPORATION

SCALE
MILES 20 10 0 20 40 MILES

far north-west have under one hour's sunshine a day. The same pattern, except for longer duration, is observed in summer. For Scotland as a whole 4 to 5 hours is the average daily duration; the south-east has the maximum of 4-5 to 5 hours while the north-west has less than 4 hours. The distribution of sunshine, thus, emphasises the generally frequent prevalence of cloud cover that has its restrictive effect on agriculture. On the high ground particularly, the effect of altitude on temperature is further augumented by clouds with the result that farming finds limited scope in the valleys.

The north-eastern Highlands particularly stand out for the frequency of frost; in some areas no month is frost-free. In contrast, areas around the mouth of the Clyde Glasgow), typical of the west central region, have ground frost for half as many days as the north-east. The north and the north-west, in spite of the latitude, have the largest frost-free[6] period while the eastern areas have a fifth to a third of the days in a year without frost.

(*iii*) **Rainfall and Evaporation** : Rainfall in Scotland is associated with the frontal activity as the country lies in the path of west to east moving depressions. The orographic effect is manifest in the west where the wettest upland areas lie at some distance from the coast. East gets rain in summer from the storms caused by the unstable air. The amount of rainfall in general decreases from the north-west to the south-east. The western half, especially in the western Highlands, has an average of more than 60 inches annually. For the Outer Isles the amount varies from 40 to 60 inches. A large part of the north and also of the south experiences rainfall of up to 60 inches per annum. Over much of the north-east and the south-east and also in the extreme north-west, 40 inches is the normal amount. The eastern and south-eastern seaboards are the only areas of the country with minimum annual precipitation of 25 inches.

SOILS

Green[7] observes that "over almost the whole of the land of Britain precipitation greatly exceeds annual evaporation". This is particularly reflected in Scotland. The excess of moisture in a cool climate arrests the development and growth of soil into a phenomenon of variety and range. Peaty soils, resulting from excessive rainfall, less evaporation and poor drainage are the characteristic feature of the Highlands and Western Islands.[8] In the lowlands and valleys much depends on the nature of parent rock. Quartzites yield poor soil ; rocks less resistant to weathering, such as gneiss and schist give better soils. However, the more fertile soils are derived from the old red sandstone. Although their pattern as a whole is no way simple, the solid of Scotland may be characterised as drift soils. The morphological change and the topographical phenomenon, as is seen at present, date back to the glacial periods. Glacial debris covers a large part of the country and varies not only in thickness but in physical composition, according to whether the drift is glacial or fluvio-glacial.[9] Over much of the country drifts form the parent material giving rise to soils of which the type depends on the physical and chemical composition of the underlying drift material. Drifts, however, are charged with acidity in varying degrees according to variation in excess moisture. Soils

derived from underlying hard rock are limited[10] and found in parts of the Central Lowland, in the south-east and south-west.

The composition of soil and the nature of the parent rock from which it is derived have their importance related to the fact that the effect of high rainfall, as has been observed[11], varies with the texture of the soil. In an eastern area of 35 to 37 inches rainfall range, soils formed on boulder clay overlying carboniferous rocks have been found to be heavy and less than 40% of the area is improved land. In areas where light soils are derived from igneous rocks or from sand and gravel over red sandstone, 60% of land is under arable cultivation.

LIMITATION AND ADJUSTMENT

The distribution of temperature and sunshine and the relationship between soils and precipitation, as discussed above indicate that Scotland experiences precipitation to an extent that it becomes a limitation in farming. For, in terms of balance of evaporation and precipitation, as Green has pointed out, not only is potential evaporation, considered as essential for water-tension (a necessary condition in the maturation of seed-breeding crops) insignificantly low over almost the whole of the western Highlands & Islands, but it is fairly low over the entire country. The limited coastal areas around the Moray Firth and some coastal parts in the south-east and south west are the only exception. A large part of the western Highland, as a so much of the in the western Islands, is not suited to cultivation.

Within these environment limitations Scotland has evolved a system of agriculture in which stock has the pride of place. Arable farming, geared to stock, has had ample development in areas of better soil and climatic conditions. To the 20th century belongs the glass-house market-gardening, confined mainly to urban-industrial centres of the Central belt. Since the Agricultural Revolution of the seventeenth century, however, Scotland has pioneered high quality husbandry in the world. The Scottish breed of stock and stock-raising tradition have flourished in different parts of the world, particularly in the Americas, in Australia and in parts of Asia and Africa. This tradition is, indeed, the high pitch of "possibility" that the Scots have been able to create out of their harshly determinist environment.

CONCLUSION

The physiography and climate of insular Scotland, situated in high latitudes, impose certain limitations on agriculture. Glacial drift soils, excess of precipitation over evaporation and frequency of cloud cover are some of the aspects of physical geography tha t restrict farming operation spatially as well as in variety.

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CHINA'S ATTITUDE TOWARD HER NATIONAL SPACE; IT'S RELATIONSHIP TO SINKIANG*

RAYMOND M. BROD†

> The important consideration is not symmetry or concentricity, but perception and imagery of the world as it ought to be, and the relations of these to the formulation of China's foreign policy.[1]

China's idea of a world order, centred on Peking is a concept almost as old as China itself. This order, perceived or imagined, is important If one wishes to understand the motivations behind foreign policy decisions made by China's leaders. The Chinese concept of a world order is simple in design and complex in its functional attributes. Basically, China sees Asia (and the world) as a series of concentric regions or zones centred on a core area. Traditionally, the order comprised four parts. The first part, "China proper", consisted of southeastern China from Peking to Yunan. This was the core area. The second zone covered Tibet, Mongolia, Sinkiang, and the southern portion of Manchuria. A special peripheral zone consisted mainly of those areas outside present China which were claimed by the T'ang and Han dynasties. This area reached from the east coast of the Caspian Sea north through Lake Baikal to the Soviet Maritime Provinces of the Pacific coast. Zone three, Outer Asia, consisted of northern Kazakhstan, the Indian Ocean littoral, the Philippine Islands, and Japan (Fig. 1). This model of the world as it should be was not static in design, although it did persist roughly in its desired form until the Ch'ing Dynasty (1644 to 1912). The model was modified throughout history to meet tactical or strategic needs of China. One of the greatest departures to this model occurred during the Ch'ing Dynasty, when Russia negotiated the first boundary treaty with China. The definition of the eastern boundary of China and Russia automatically modified the model because China perceived a world order without legally defined areas, and did not accept the concept of national space based on western systems of international law.

The Ch'ing period is important in Chinese history for a number of reasons relevant to conditions in China today. According to Ping-Ti-Ho[2] there were four contributions from the Ch'ing period that are visible today. First, much of present day China's impact on the world is due to China's size and the location of her frontiers. Also, the contribution of the Ch'ing period to the formation of modern China as a geographic and ethnic entity is of great significance. Second, China's legacy of a large population was received from the Ch'ing period. Third, it was the most successful dynasty of conquest, and its primary key to success "was the adoption by the early Manchu rulers of a policy of signification." Fourth, maturity in economic and social areas and a large degree of

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* It may be stated that the views and opinions held by the author in this article are entirely his and not that of the publishers.

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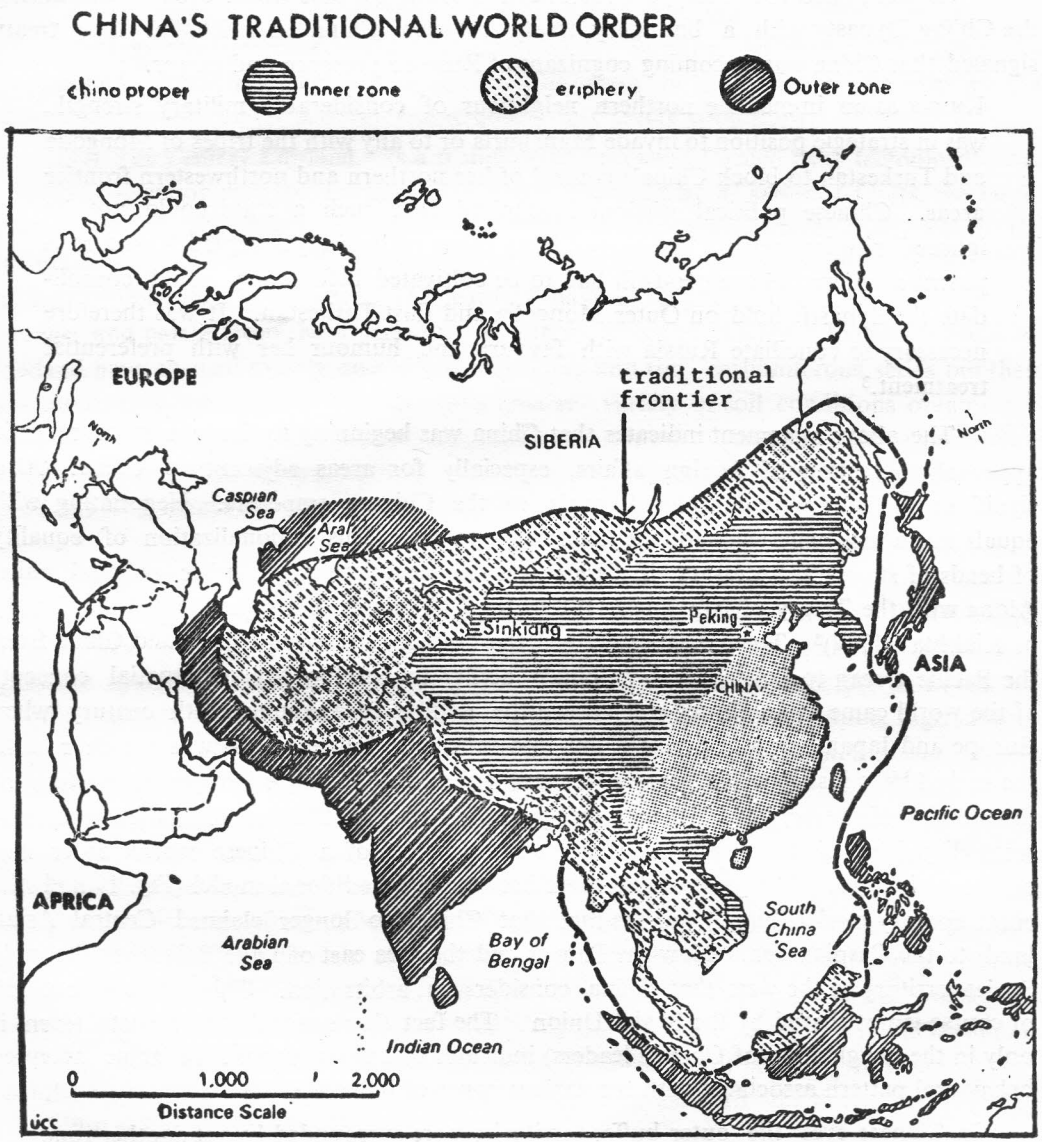


Sources Kasperson and Minghi, p. 333.
U.S. Central Intelligence Agency, Peoples Republic of China Atlas, p. 75.

International boundaries on this map are not necessarily authoritative

interregional integration was attained. The consolidation of China proper, and a unified workable policy toward the peripheral non Han regions allowed for, at least to the middle of the nineteenth century, an era of relative peace and tranquility.

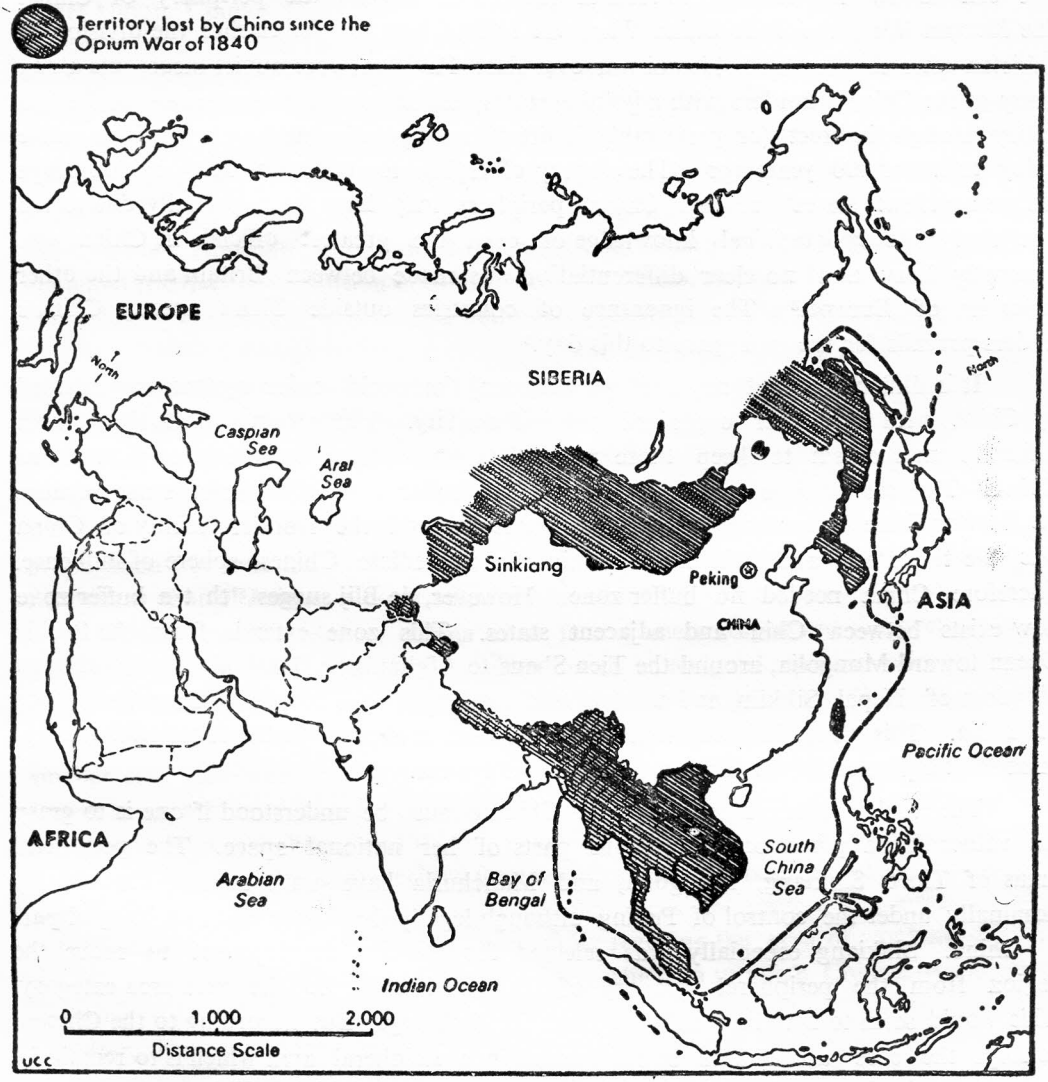
As mentioned previously, the modification of the Chinese world order began during the Ch'ing Dynasty with a boundary treaty between China and Russia. The treaty signaled that China was becoming cognizant of Russia's presence and power.

> Russia as an immediate northern neighbour of considerable military strength, was in strategic position to invade Manchuria or to ally with the tribes of Mongolia and Turkestan to block China's control of her northern and northwestern frontier areas. Chinese political wisdom recognized that such a state could not be ignored with impunity. The early Ch'ing rulers realistically accepted Russia as a potential enemy, whose goodwill had to be cultivated before they could consolidate the dynastic hold on Outer Mongolia and East Turkestan. It was therefore necessary to conciliate Russia with favours and humour her with preferential treatment.[3]

The above statement indicates that China was beginning to have a more realistic approach to matters of foreign affairs, especially for areas adjacent to China. Also significantly, Czars were considered equals to the Chinese emperors. Negotiating with equals was a new experience for the Chinese emperors. This rationalization of equality of heads of state was necessary if China was to negotiate with other political units. Along with the Treaty of Nerchinsk (1689)[4] the Ch'ing empire also negotiated the Treaty of Kiakhta ((1727)[5]. These treaties defined the boundary between Russia and China from the Pacific Ocean to Lake Baikal. China's ability to develop her own spatial concepts of the world came to an abrupt end toward the middle of the nineteenth century when Europe and Japan began to divide China into spheres of influence. It was not clear until the early 1950's just how 100 years of turmoil had affected China's conceptual pattern of the world. However, in 1954 a map was published by the Chinese Communist government (Fig. 2) which clearly showed that the basic pattern of a Chinese world order had not been changed. The greatest difference between the traditional model (Fig. 1) and the contemporary model (Fig. 2) was the fact that China no longer claimed Central Asian lands to the Caspian Sea. Now the Pamirs and the area east of Lake Baikal are the only Soviet territory to the west that China considers in arbitration. This Chinese outlook of course is not shared by the Soviet Union. The fact that a world order exists (even if only in the imagination of China's leaders) indicates that there should be some accepted behavioral pattern associated with the various zones of influence.

> In Chinese eyes the outer buffer territories were surrounded by yet another zone of tributary or client states . . . This intricate system of protective buffers and tributary states insulated the compact inner core of China and obscured the actual territorial limits of Chinese political control. This situation conflicted with European concepts of demarcated, rigid boundaries marking the limits of state powers.[6]

CHINA'S CONTEMPORARY WORLD ORDER



Source; U.S. Central Intelligence Agency, Peoples Republic of China Atlas, p. 75.

International boundaries on this map are not necessarily authoritative

The preceding statement indicates that the proper procedure for neighbouring states was to pay tribute and recognize Peking as a central authority from which all stability generated. The technique of client states paying tribute was supplemented with a system of keeping adjacent states at war with each other, or at least in a state of weakness. This is reflected in many instances today. China, for instance, was openly hostile to Burma until the United States aid program was terminated in 1971.[7] One can follow the turmoil in Asia as one moves around the periphery of China. The Korean War, the Indo-China War, the India-China border clashes, the division of Pakistan after the Indian-Pakistani war over East Pakistan, communist insurgents along many of the Chinese borders with adjoining states, all indicate that the nation of foreign policy through indirect (or preferrably indirect) manipulation and agitation is as viable today as it was 400 years ago. The legacy of trying to maintain hazy relationships between "client states" around China's periphery may have been partially due to the fact that "the geographical knowledge of even the greatest officials in China was extremely hazy and no clear differentiation was made between Britain and the other countries of Europe.[8] The ignorance of countries outside China among China's leaders prevails for the most part to this day.[9]

It is difficult to find any anology between the world order system as perceived by China with any other organized political activity. The system was developed as a defensive mechanism to keep those within its sphere from becoming as powerful as China. The system was not the concept of a buffer zone in the strict sense because (at least until the seventeenth century) no state beyond the frontier vicinity of China was able to extend and hold land within the immediate Chinese sphere of influence. Therefore China needed no buffer zone. However, de Blij suggests th t a buffer zone now exists between China and adjacent states. This zone extends from the P.cific Ocean toward Mongolia, around the Tien Shans to Afghanistan, Kashmir, the Himalayan kingdom of Nepal, Sikkim, and Bhutan, and sections of the Northeast Frontier Agency of India. This would indicate that there has been a change in the functional concept of at least a portion of the Chinese world order system.

The world order as seen by the Chinese must be understood if one is to grasp the values China places on the various parts of her national space. The peripheral areas of Tibet, Sinkiang, Mongolia, and Manchuria have until recently been only nominally under the control of Peking although legally they have been an integral part China. Sinkiang especially was selected for intensive development to move the region from the peripheral category of the world order to the core area category. This would seem to act as a stabilizing force for Sinkiang. But according to the Chinese concept the core area should be surrounded by a peripheral area which is to remain in constant agitation, and paying some sort of tribute to Peking. This can only mean that the area directly opposite Sinkiang which is Soveit Middle Asia should attain the characteristics of the peripheral zone, thus diminishing any threat to the Chinese core area, which today is represented, at least theoretically, by the present Chinese national space minus Taiwan. Developing this line of thought Ginsburg states that :

It follows therefore that another continuing force in China's foreign policy would derive from attempts to restore Chinese hemegony not over Southeast Asia, but over those territories of Outer Mongolia and the Soviet Union which were part of the traditional Zone II[11].

The fact that the Soviet Union has the military power to prevent such a Chinese policy is important. However, when China attains a military capability equal to that of the Soviet Union, China's attitude toward a negotiated settlement with the Soviet Union may change[12]. It seems that there is not much the Soviet Union can do to stop the Chinese from developing militarily, unless there are some type of preventive military raids to neutralize or retard China's development. Theoretically then, Sinkiang and the other first order political units along China's western and northern tiers are to become important areas in the defence of China's historical core, progress to the point where they become part of the core area, then serve as a base for expanding into those areas outside China which China considers important to her national defence or those areas she lost due to "unequal treaties". Expansion does not necessarily mean military takeover. It is probable that the goal of China is not the addition of territory but the influence over territory. This is partially indicated by the fact that China has recently suggested to the Soviet Union that their disputed territories become demilitarized zones.

In Central Asia China has one great asset. This is the advantage of a large Asian population in the Soviet Asian Republics more related to China historically and ethnically than to the Russians. Therefore, the chances of extending the sphere of agitation beyond the borders of Sinkiang are very real. The Soviets would probably retaliate in any propaganda war initiated by the Chinese, but the fact remains that in Soviet Middle Asia Europeans control Asians, a point amplified by Chinese propaganda statements.

Herein lies the danger China must face if she is to proceed to develop her own concept of a world order. If certain regions are to be assigned specific roles or values, and those regoins lie outside of China's legal boundaries (as defined by Western standards) then international friction will undoubtedly develop. Little or nothing can be done by the smaller states to diminish their roles in the Chinese world order, but India and the Soviet Union have constantly frustrated China in her attempts to develop a defensive organization of space in Asia. Sinkiang and the other internal units bordering on India and the Soviet Union will become important regions for the diffusion of Chinese power to the peripheral areas outside China and also must act as buffer zones to protect the more populated core zone of China. The process for successfully reaching the goal of making Sinkiang and the other border regions a stable base from which to promote Chinese Asian policy is being developed. These developments are setting in motion centripetal forces which are strengthening Sinkiang and the other border regions, and giving China important political advantages never before realized. The processes of political interaction, especially in border areas is greatly affected by power vacuums. Poorly organized units are usually absorbed by more powerful neighbouring states. There is nothing new to this concept except that much of the territory annexed in Asia has been done at the expense of China by Czarist Russia. This annexation of territory, referred to as "unequal treaties" by the

Chinese was due to the fact that China did perpetuate the system of disorganization (or at least did not foster the concept of an organized state) beyond her immediate core area. It was natural therefore for the more powerful state to incorporate many areas paying tribute to China, but not united to China politically. The Soviet Union interprets this incorporation of territory as "historical development" and uses this as the primary argument to maintain the present status quo.

There is no reason to believe that China has abandoned her idea of a world order, although it has changed in context to meet present conditions such as defined national space, organized political units along her borders, and a still relatively weak military establishment. It can be concluded that the Soviet Union will attempt to neutralize Sinkiang and the rest of western China should no agreement be reached between Moscow and Peking on mutual border problems, or if China persists in a militant political stand against the Soviet Union. However, the longer the Russians wait to solve their problem with China, the more difficult it will be to resort to the option of any type of military action. The political disadvantages China suffers in her non Han areas will not last indefinitely. Economic development and a vigorous migration program of settling Han Chinese in minority areas is allowing China's historical core to become larger and stronger than any time in history. Sinkiang, because of its location, is the keystone to China's defence and a solid base for any projected movement into Soviet Middle Asia.

Presently there seems to be two ways that the Soviet Union can reduce the pressure China exerts on Soviet Middle Asia. The first would be to help Sinkiang secede from China, much in the fashion of Outer Mongolia. Sinkiang has been independent before so the concept of an independent state of Sinkiang is not foreign to the minds of the various indigenous groups occupying that area of China. The second way would be for the Soviet Union to develop a policy of containment through military and political pressure around southern and eastern China and a strong defensive stature along the Sino-Soviet and Sino-Mongolian borders.

Regardless of the political and military activities of the Soviet Union, only China's willingness to accept the "unequal treaties" will relieve the current border problem. This China will not do until she has been given enough face saving option coupled with a boundary agreement she considers acceptable to her national aspirations which consists basically of security within a world order she can control, if only partially.

Reference and Notes

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to the Sea of Okhotsk. See Jackson, W.A. Douglas, *The Russo – Chinese Borderlands*, 2nd ed,. New Jersey : Van Nostrand, 1968. p. 137.

5. The Treaty of Khiatka fixed the boundary between Mongolia and Siberia. China lost nearly 40 000 square miles between the Upper Irtysh River and the Sayan Mountains. See Jackson, *op. cit.*, p. 138.
6. Central Intelligence Agency, *Peoples Republic of China Atlas*, Washington, D.C. November, 1971, p. 74.
7. Houn, Frank, "Chinese Foreign Policy in Perspective", *Bulletin of the Atomic Scientists*, XXVIII, No. 2. February, 1972, p. 18.
8. Cranmer—Byng, J.L., "The Chinese Attitude Toward External Relations", *International Journal* XXI, No. 1. Winter, 1965-66 p. 59.
9. *Ibid.*, p. 74.
10. de Blij, Harm J., *Systematic Political Geography*, New York : Wiley & Sons, 1967. p. 262.
11. Ginsburg, *op. cit.*, p. 337.
12. Whether the Soviet Union allows China to reach military parity is an important question.

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