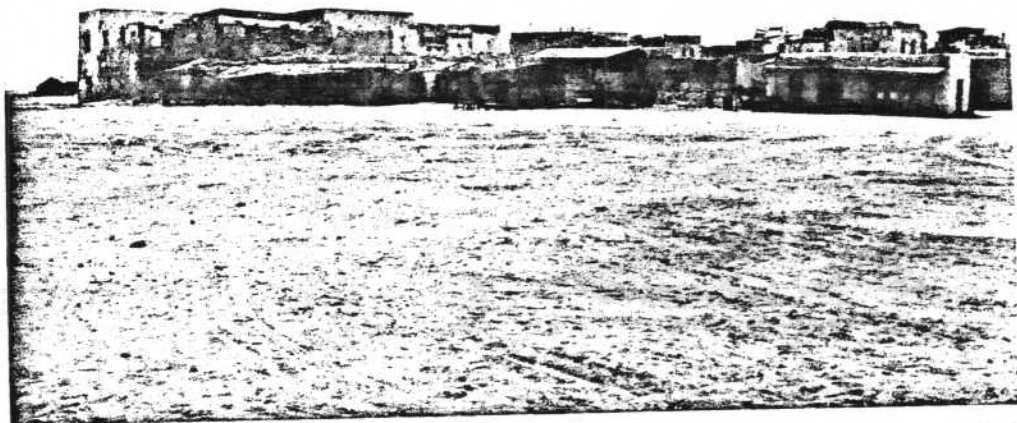
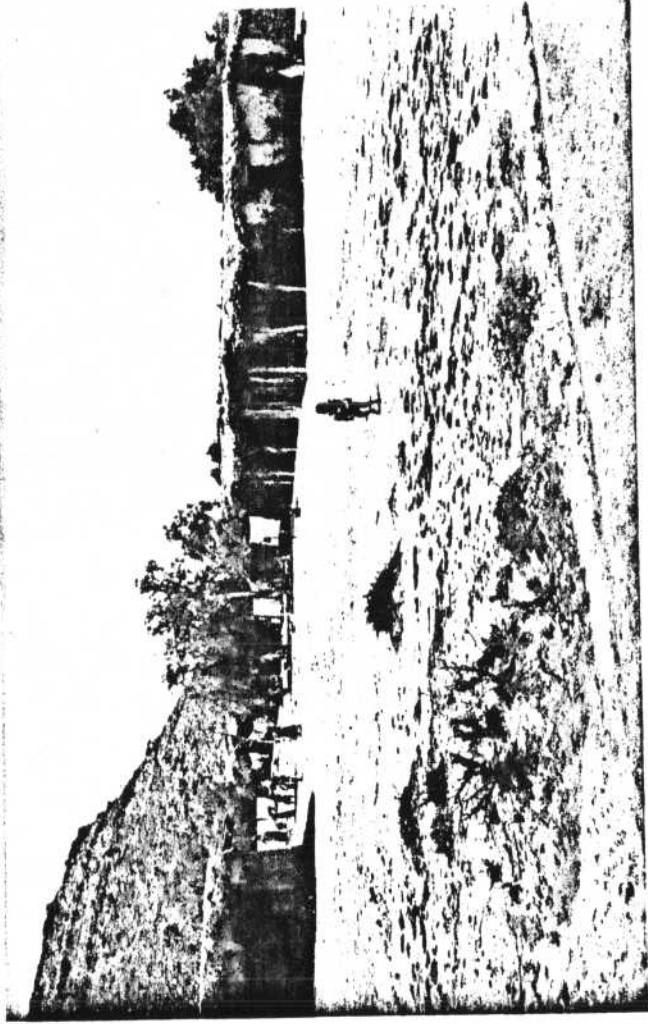




1. The Survey Team at Zeila. Back row, left to right, beginning fourth from left: Ali Farah Warsoma, dresser; Abdullahi "Yere", driver; Abdullahi Farah Sugai, dresser; Idris Suban Farah, Acting District Commissioner of Zeila. Front row, left to right: Gary Brown, Peace Corps Volunteer; Virginia Lee Dean, Peace Corps Physician's wife; Andrew G. Dean, Peace Corps Physician.



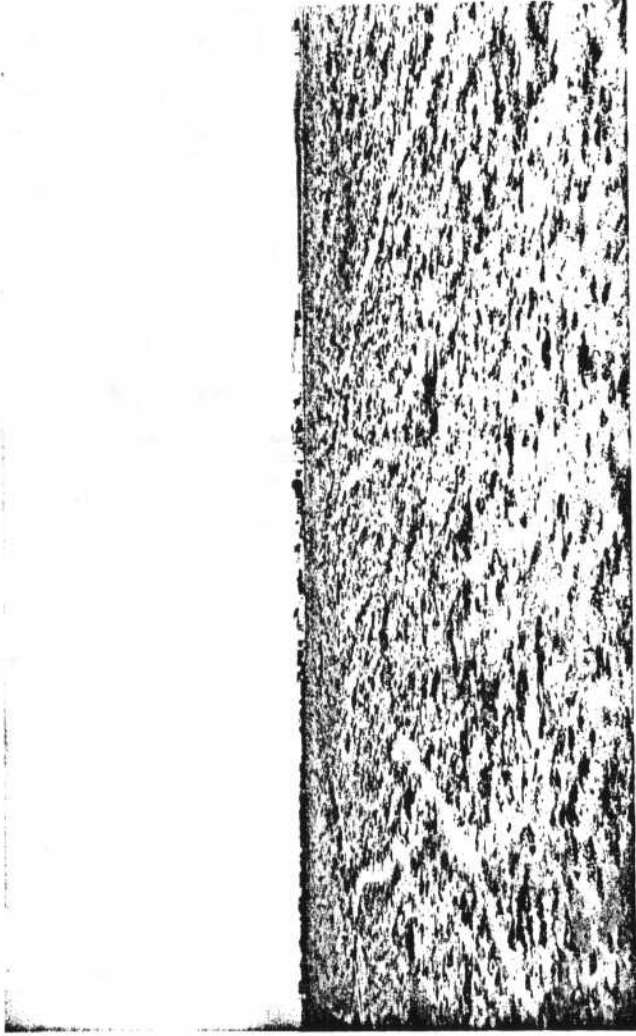
2. Zeila. The main street, showing teashops amid the ruins of the old Arab seaport town.



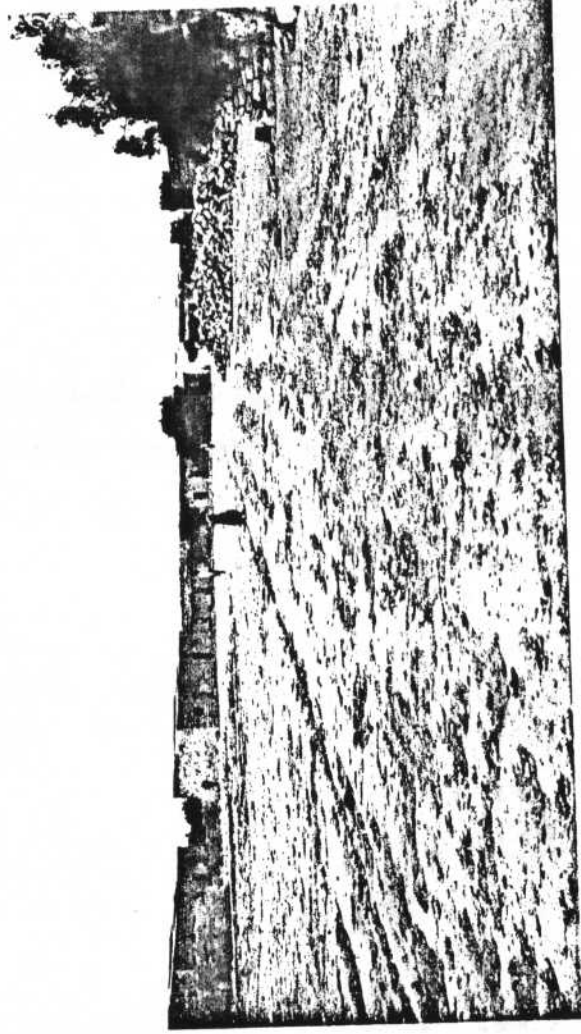
3. Qolujeed. The town consists of several rows of houses and shops such as those shown here, and is a gathering place for nomads in the area.



4. The town of Salaahley. A truck carrying goods from Mogadishu has stopped at a local teashop.



5. The town of El Af-weyn. The general setting of a typical Eastern town.



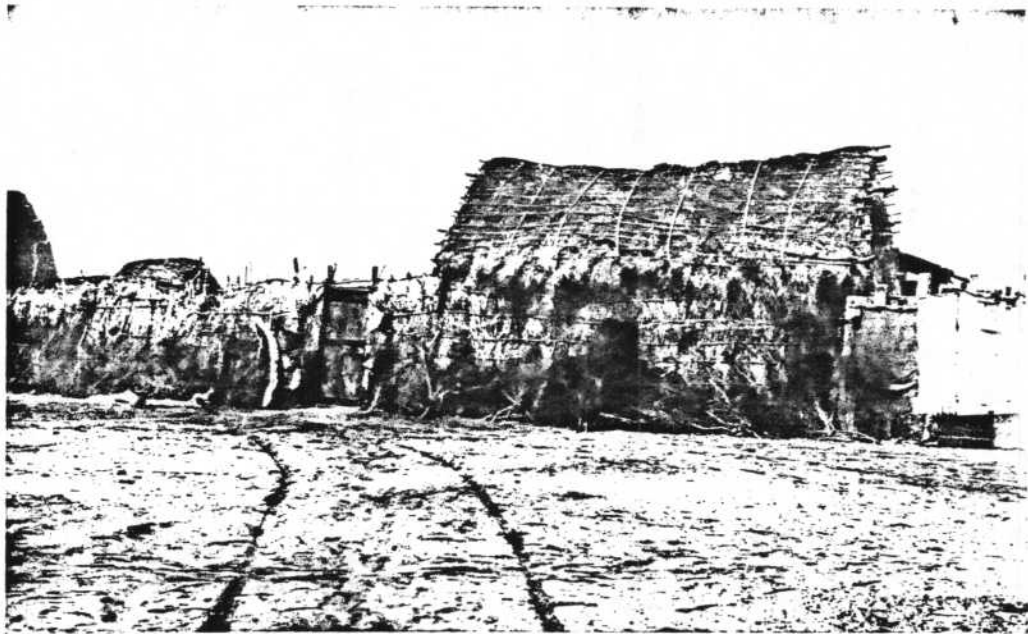
6. El Af-weyn. The main street.



7. Housing. Nomadic huts ("Somali aqals") arranged in a circle with a thorn fence surrounding them in typical fashion. Aqals can be dismantled and packed onto a burden camel in a few hours. At night the sheep and goats are driven inside the barrier; in the daytime they are herded nearby.



8. Housing. Stone houses and shops in the town of Taleh. This is the commonest type of dwelling in towns, although Somali aqals are usually found on the edge of town as well (see Photograph No. 10).



9. Housing. This thatched house in Zella is one of several types found in the town in addition to the ruined stone buildings, many of which are still occupied. Thatched houses are uncommon in the rest of the North, however.

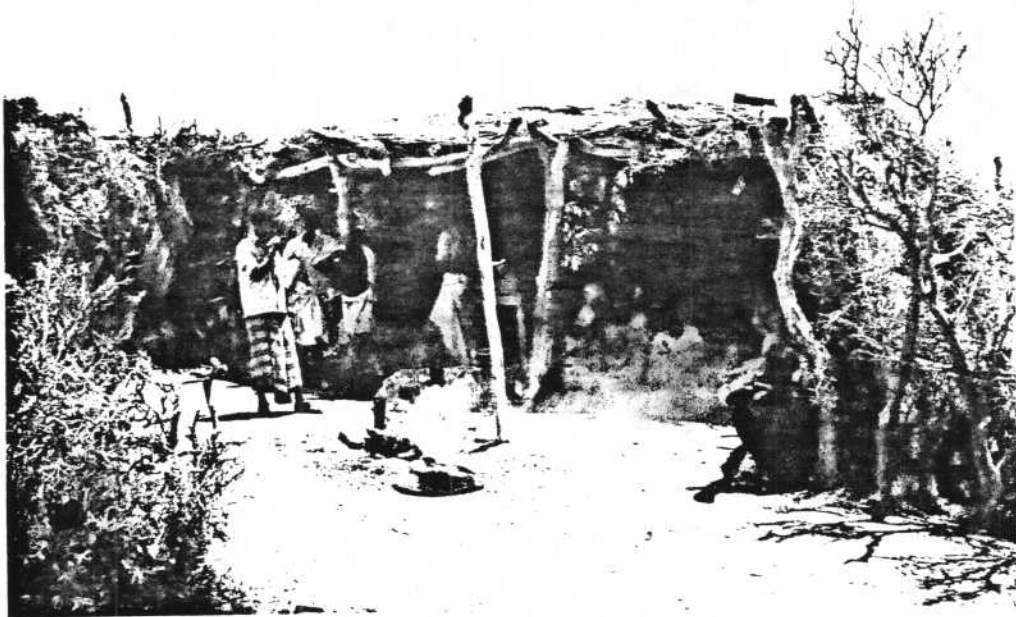


10. Housing. The periphery of Harqeisa, the largest town in the North, shows a mixture of Somali aqals and stone houses surrounding a large cemetery (right).

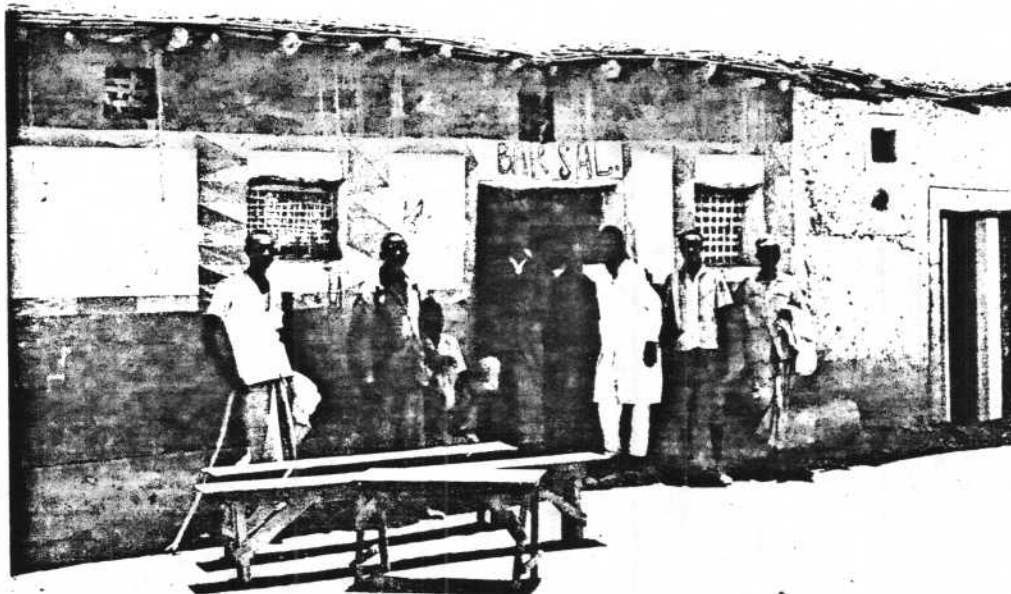
11. Occupations. Nomadic life--camels grazing in the Eastern region. The majority of northern Somalis earn their living directly or indirectly from livestock.



12. Occupations. Farming—a garden in Arabsiyo, a town where jowari, maize, papayas, guavas, pomegranates, limes, potatoes, onions, tomatoes, and cabbage are raised.



13. A teashop, the center of male social life.



14. A teashop which serves meals as well and is therefore known as a hotel.

DISTRIBUTION OF THE SURVEY SAMPLE

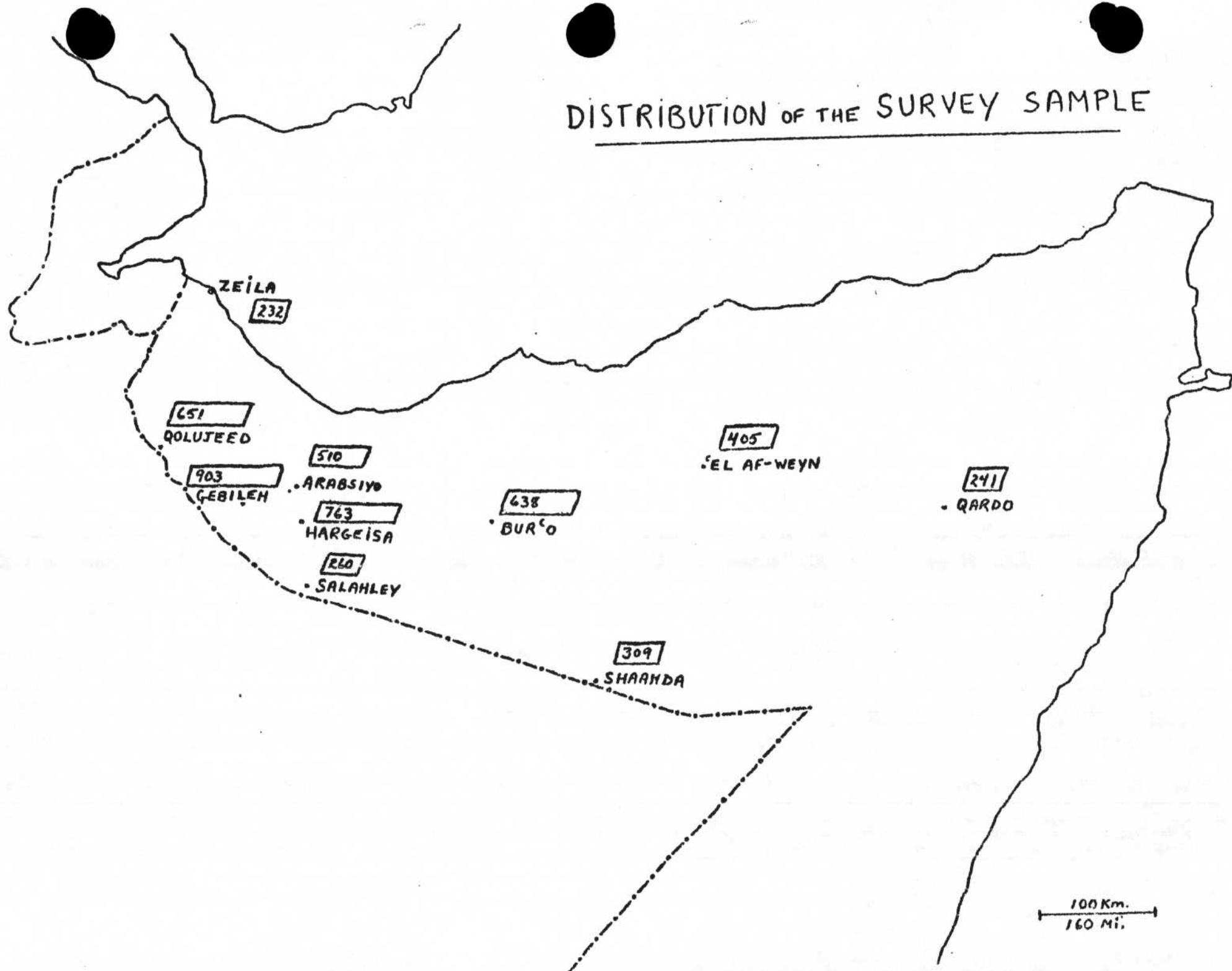


TABLE I

Percent of Population with Positive Tuberculin Tests (over 10 mm.), by Age-Group and Town

Town	# People tested	Age 0-4 # pos./ # tested %	Age 5-9 # pos./ # tested %	Age 10-14 # pos./ # tested %	Age 15-19 # pos./ # tested %	Age 20-39 # pos./ # tested %	Age 40 & over # pos./ # tested %
West							
Zeila	232	1/28 4%	9/24 38%	15/27 56%	13/17 77%	47/60 78%	56/76 74%
Qolujeed	651	14/123 11%	59/129 46%	51/86 59%	36/46 78%	159/179 89%	69/88 78%
Arabsiyo	510	12/115 10%	36/80 45%	85/121 70%	44/57 77%	104/114 91%	20/23 87%
Gebileh	903	12/137 9%	41/139 30%	159/242 66%	141/160 88%	169/180 94%	40/45 89%
Central							
Salakley	260	1/41 2%	5/26 19%	37/59 63%	35/48 73%	46/58 79%	22/28 79%
Hargeisa	763	12/156 8%	43/152 27%	129/223 58%	51/83 61%	82/109 75%	27/30 90%
Bur'io	638	0/21 0%	17/84 20%	214/320 67%	141/165 85%	36/42 86%	5/6 87%
East							
'El Af-Weyn	405	4/76 5%	13/52 25%	25/45 56%	7/14 50%	98/135 73%	56/83 67%
Shaakda	309	7/37 19%	19/56 34%	45/75 60%	19/24 79%	63/73 86%	34/44 77%
Qardo	241	1/11 9%	7/18 39%	50/91 55%	60/73 82%	30/41 73%	7/7 100%
Total	4,912	64/745 8%	249/770 32%	810/1289 63%	547/687 80%	834/991 84%	336/430 78%

East vs. West

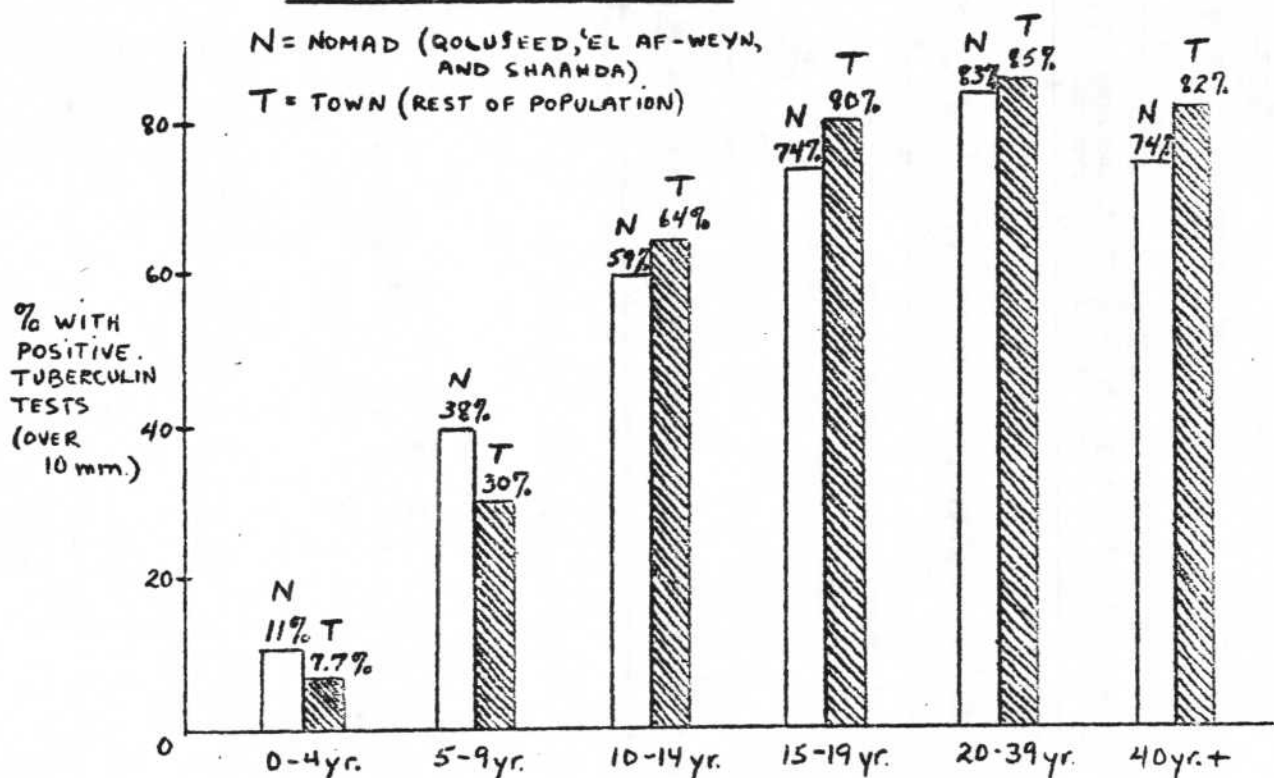
Table II

Percent of population with positive tuberculin tests (over 10 mm)
by age and geographic area.

Age in years	West (Zeila, Qolujeed, Gebileh, Arabsiyo, Hargeisa, Salakalay)	East (Burao, Shahada, El Af-Weyn, Qardo)
0-4	8.6%	8.3%
5-9	35	22
10-14	63	63
15-19	78	82
20-39	87	78
40 & over	81	74

Although it was the subjective impression of the team that tuberculosis was more prevalent in the towns of the West than of the East, the above figures demonstrate very little significant difference between the two areas, and indicate that tuberculosis is an equally serious problem in both.

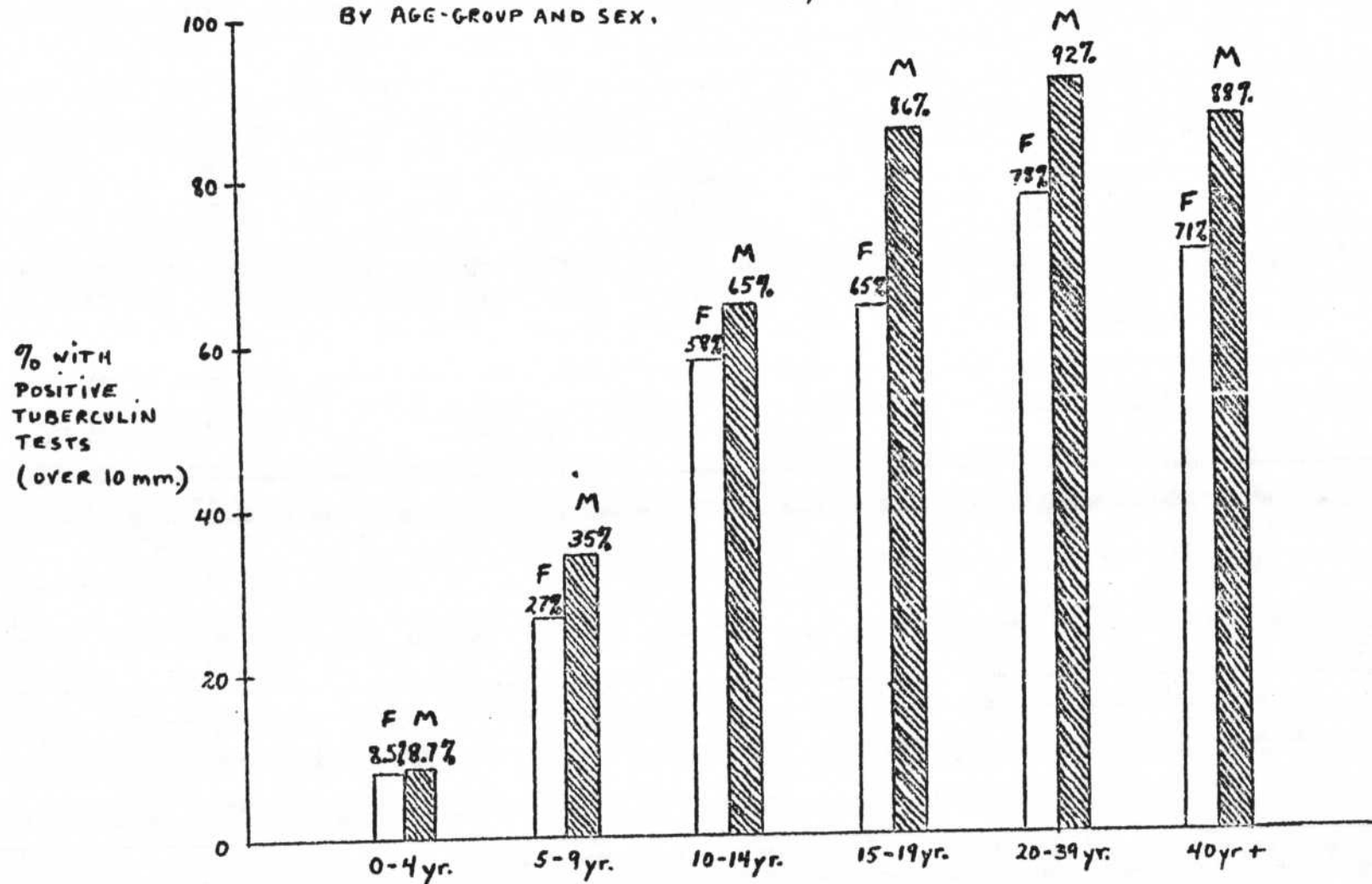
"NOMADS" vs. "TOWN PEOPLE"



Three towns--Qolujeed, 'El Af-Weyn, and Shaahda--contained a high percentage of nomads and semi-nomads. When compared with the population of the remaining towns and cities, as above, the nomadic people have very nearly the same pattern of tuberculin sensitivity. This needs to be tested by doing a survey of unequivocal "nomads"--people found living singly or in small groups in the "bush."

MALES vs. FEMALES

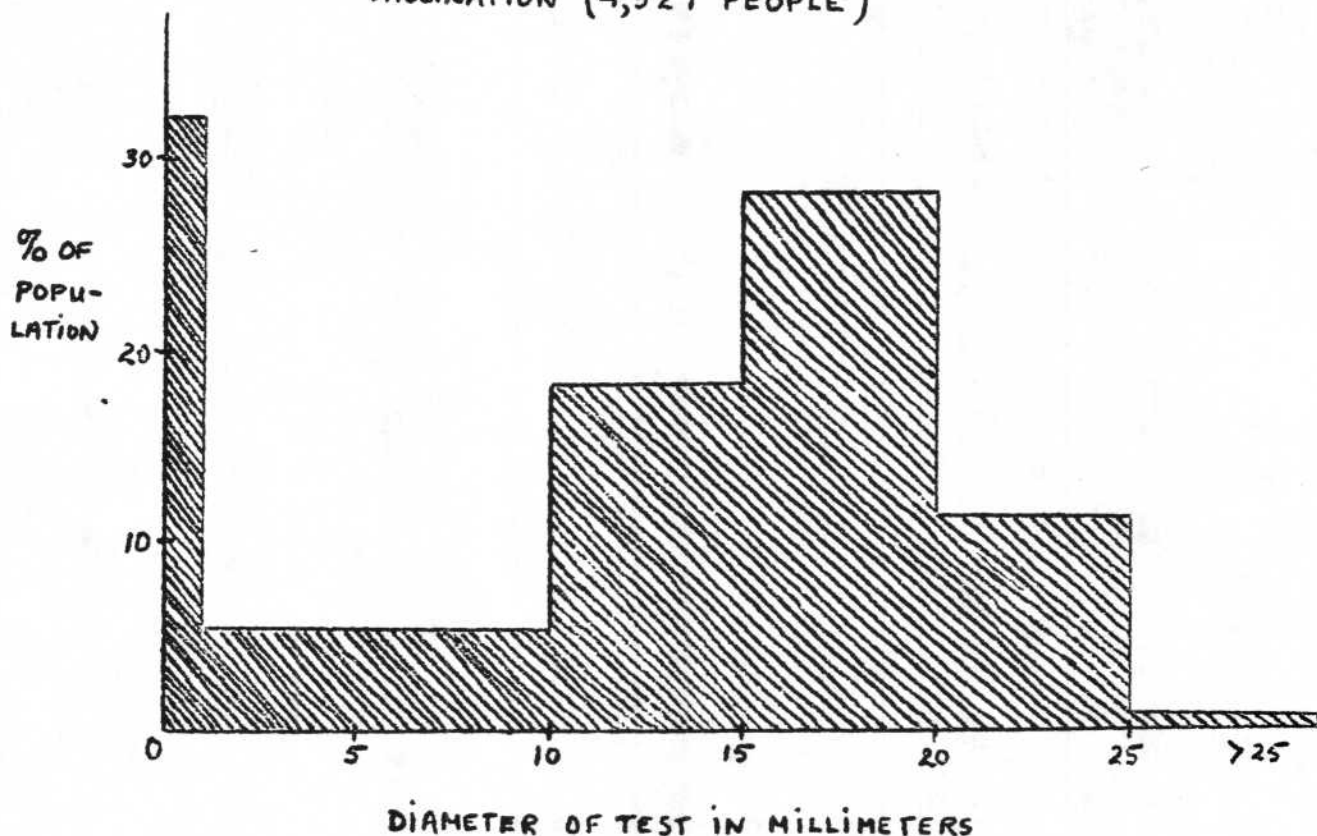
% OF POPULATION WITH POSITIVE
TUBERCULIN TESTS (10mm. OR OVER),
BY AGE-GROUP AND SEX.



Comment: After age 4, males have more positive tests than females. This is probably related to the smaller number of social contacts made by the women, who, for example, never go into teashops.

SIZE OF TEST

PEOPLE WITHOUT PREVIOUS BCG
VACCINATION (4,527 PEOPLE)



Comment: Approximately 10% of the population had tests of 1 to 9mm. in diameter, representing a low level of what is often called "non-specific sensitivity." The two peaks at 0 and 10mm., however, provide generally good separation between "positive" and "negative" tests, and non-specific sensitivity is not a major problem in this population.

Previous BCG Vaccination

Of the 4912 people tested, 555 had scars of previous BCG vaccination. Of these 20% had tuberculin tests of 0 mm. and 37% of the tests were smaller than 10 mm.

Hence only 11% of the population was previously vaccinated (most of these being school children) and only 4% may be expected to have much effective immunity at the present time as a result of prior vaccination.

Smallpox Vaccination

Table III
Previous Smallpox Vaccination

<u>Town</u>	<u>% of Population with Smallpox Vaccination Scars</u>
Zeila	61%
Qolujeed	63
Arabsiyo	64
Gebileh	46
Salahaleh	48
Hargeisa	67
Burao	59
El Af-Weyn	17
Qardo	56
Shahada	22
 Total 2605 scars/4912 people	53%

Table IV
Previous Smallpox Vaccination
By Age Groups

<u>Age in years</u>	<u>% of Population with Smallpox Vaccination Scars</u>
0-4	36%
5-9	55
10-14	56
15-19	55
20-39	51
40& over	47

Although there is some geographical unevenness in coverage, all age groups have at some time received a considerable number of smallpox vaccinations. Because many of the scars are very old and because approximately half the population is not yet vaccinated, protection would not be adequate if smallpox should break out.

Table V

Infant and Child Mortality

Women under age 40		
Number of children delivered		1492
Number of children "died when still young"		356
	Percent	24%
Women over age 40		
Number of children delivered		1386
Number of children "died when still young"		620
	Percent	45%

For practical purposes this may be taken as a measure of the number of children who die before reaching the age of ten years.

Summary and Conclusions

1. A tuberculin survey and BCG vaccination campaign has been conducted in the North by a team of Ministry and Peace Corps personnel. The population was in general receptive, and the vast majority of the people contacted were willing to be vaccinated.
2. There is an extremely high percentage of positive tuberculin tests in the North.
3. There appears to be very little difference between nomads and town people and between eastern and western areas with regard to tuberculin sensitivity. Further study of the nomads is desirable.
4. The great majority of tuberculin tests were either completely negative (0 mm.) or over 10 mm. in diameter. Non-specific sensitivity does not appear to be a big problem in the area surveyed.
5. Although BCG vaccination campaigns have been conducted in the past, most of these vaccinated were school children, and only about 4% of the population now has protection from previous vaccinations.
6. Approximately half of the population has not yet been vaccinated for smallpox and many others have not been revaccinated in recent years.
7. The infant and child mortality rate is about 24% for young mothers and 45% for those over 40 years old, indicating that the rate is falling, but is still high.
8. It is recommended that a BCG vaccination campaign and smallpox vaccination campaign be carried out. A plan for the campaign is presented in the next section. It is also recommended that a pilot project for the ambulatory treatment of tuberculosis be initiated.

WHY TUBERCULOSIS CONTROL?

In a country with a limited budget, one must ask if tuberculosis control deserves an important place in the overall development effort. We believe it does for the following reasons:

The high incidence of TB in the North has been demonstrated by this survey. Nine percent of the children under age five have already acquired the disease and 84% of adults have had it at one time or another in their lives. There are about as many hospital beds devoted to TB patients in the North as there are for all other diseases combined. Many mornings at the Outpatient Clinic of Group Hospital in Hargaisa bring to light three or four new cases of advanced, cavitary TB, and it is not difficult to find evidence of Potts disease and tuberculosis of the cervical glands in citizens one encounters on the streets.

In the North no other disease competes with TB as a problem, except, at certain seasons, malaria. Diarrhea of infants and possibly measles are also serious public health problems, but because of the dry climate, the North does not have the great variety of "tropical" diseases such as schistosomiasis, intestinal parasites, yaws, leprosy, etc.

Tuberculosis affects adults, the people who have already survived the diseases of childhood, who have grown up, been educated or trained for a job, and are ready to contribute to the growth of the economy. Hence it is economically a more damaging disease than the childhood illnesses.

Tuberculosis is a long-term, crippling disease. Unlike many diseases which are either rapidly fatal or heal without after effects, TB may last for many years or heal but leave the patient unable to work. The patient must be fed and supported during this time without making any contribution to society; hence TB is a very expensive disease.

There is a great deal of public interest in TB control in the North. People are aware of the problem and very much fear this disease. The survey just completed shows that the public will cooperate with vaccination efforts, and is eager to have help in fighting TB.

Facilities are already available for attacking TB. A number of hospitals, x-ray machines, and at least two doctors are assigned to treatment of TB at the present time. If the load on these facilities could be reduced by BCG vaccination and ambulatory treatment programs, they would be adequate for treatment of the cases which actually require hospitalization. Two Landrovers, given by the West German Government for TB control, are available for use in a vaccination campaign.

WHY SMALLPOX VACCINATION?

WHO and UNICEF are presently carrying out a worldwide program of smallpox eradication, and a BCG vaccination campaign offers an excellent opportunity to participate in this program by combining the two types of vaccination. Although Somalia has not had actual cases of smallpox for some time, it is essential that all Somalis be vaccinated in case smallpox should break out in a neighboring country or be brought in by a traveler.

It will be inexpensive to combine smallpox vaccination and BCG vaccination, since both may be given at the same time and smallpox vaccination requires very little additional equipment and training. If WHO and UNICEF feel that the two campaigns should be combined, and supplies are made available, then smallpox vaccine should definitely be given along with the BCG.

WHY BCG VACCINATION AND AMBULATORY TREATMENT?

One way to determine the practicality of various methods of TB control is to estimate their cost. Their medical effectiveness must be weighed as well, and a choice made of the most effective methods which the country can afford.

The approximate cost (as a very rough guess) of several common methods is as follows:

Detection Methods

Mass x-ray of entire population	2 sh.so. per person
X-ray and sputum exam. of all suspected cases	4 sh.so. per person
Sputum exam. alone of all suspected cases	2 sh.so. per person
Tuberculin testing of young children	0.2 sh.so. per person

Treatment Methods

Hospitalization of each new case for six months with drug therapy for one year	
Hospitalization (room, food, and services for 1 year)	1800 sh.so. per person
Drugs	50 sh.so. per person
Total	1850 sh.so. per person

Ambulatory treatment without hospitalization.
patient remains at home.

50 sh.so. per person
plus services of
medical personnel
(who are already
on the payroll)

Preventive Methods

Public education about health

Negligible cost with
cooperation of Min.
of Education and
Information

Improved standards of nutrition
and housing

Costly, but not primarily
the responsibility of
the Min. of Health

BCG Vaccination

Total cost about 1.5
sh.so. per person.
Vaccine protects for
about ten years; hence
costing about 0.15 sh.
so. per person per year.
Under the proposed
program, the Ministry
would pay only about
0.08 sh.so. for each
dose given, the rest
being contributed from
other sources.

Ideas about the effectiveness of the various methods have changed greatly in the past 15 years. It used to be maintained that hospitalization of all active cases was vital and that x-ray was the best detection method. In addition BCG vaccine was not considered effective in many countries, probably because the vaccine given in those days did not keep well and easily became inactive.

Recent studies have shown however that BCG vaccine prevents about 80% of the cases of TB if given on a large scale, permitting the existing facilities in a country to deal with those cases that do occur more easily. By itself it does not eliminate TB from the population, but it helps to reduce the size of the problem to manageable proportions and in this respect is a weapon in the very first line of defense against the disease.

Mass x-ray detects a higher proportion of new cases than other methods, to be sure, but in many countries, including Somalia, facilities are not adequate to treat all the cases which could be discovered. Hence a selective method such as sputum examination which detects only the worst cases--those who are spreading the infection to others--is better from a public health point of view and much cheaper because only people with symptoms are examined.

Recent studies done in India have shown that most cases of TB can be treated just as well at home as in the hospital if the proper drugs are used. The patient is happier and more cooperative because he lives with his family and the government does not have to pay the enormous cost of board, room and hospital services for him. The only expense is the relatively small one of medication.

Although formerly it was assumed that patients, if they remained at home, would infect their families, the Madras studies have shown that this is not the case, and that a patient taking the proper drugs regularly is not infectious to others. Hence hospitalization is required only for the few patients who are too ill to stay at home.

In a country like Somalia where the annual budget of the Ministry of Health is only about six shillings per person, expensive methods like hospitalization and still more expensive techniques such as chest surgery are not economically practical on a large scale. The best methods are those which prevent the largest number of cases and cure the highest proportion at low cost. BCG vaccination and ambulatory treatment will prevent and cure a high proportion of cases at a fraction of the cost for other methods; we therefore recommend that a program be initiated in the North such as that described in the next section of the report.

RECOMMENDATIONS

Negotiations were carried out in early 1967 by the Ministry of Health and Labor, WHO, UNICEF, and Peace Corps, for the initiation of a full-scale mass BCG vaccination campaign in the North. Because of public unrest arising out of the Jibouti Referendum, Peace Corps felt it necessary to postpone the project until its volunteers could again live and work freely in the North. It is hoped that conditions will again be favorable in the near future and that the plan will be put into action as soon as possible.

A PROPOSAL FOR A MASS BCG AND SMALLPOX VACCINATION CAMPAIGN IN THE NORTH, COMBINED WITH A PILOT STUDY FOR AMBULATORY TREATMENT OF TUBERCULOSIS

It is recommended that the Ministry of Health, UNICEF, WHO, and Peace Corps jointly undertake this program after a suitable agreement has been drawn up, and that the campaign be gotten underway as soon as conditions permit.

Contributions to the Program

Ministry of Health

Nine dressers or other medical personnel who can be trained for BCG work. The Ministry and the Peace Corps Physician who will supervise the project should agree on the choice of personnel before the project starts. One must be a senior dresser to act as coordinator and public relations manager for the project. All will need their usual salary plus per diem for each day they are away from their normal duty station. The workers would be sent to Mogadiscio for approximately one month's training at the start of the program.

Two Landrovers, with drivers, and access to PWD repair facilities. A fund of five hundred shillings per month for each Landrover for petrol, lubricants and repairs would be provided by the Ministry. Responsibility for control of this fund should be agreed upon before the project begins and the actual vouchers for at least six months should be in hand to prevent clerical delays.

Equipment such as beds, lanterns, etc., should be made available from medical stores for the project.

The Ministry will assist in making contacts with local officials, other Ministries, etc., in order to inform the population about the program. Local communities will be asked to provide housing for the teams while they are working.