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A SURVEY OF EGYPTIAN VILLAGE BREADS

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Egyptian Major Cereals Improvement Project (CID/USAID)  
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Finally, and most important, are my husband and family who told me to "go for it" even though it meant a sacrifice for them.

To each of these agencies and people, and to any that I may have forgotten, I extend my heartfelt thanks. This study could not have been done without each contribution.

It is my sincere hope that through the sharing of this "bread and salt" new and deep friendships may be forged between these people and myself, and between Egypt and the United States of America. I also hope that as a result of my ignorance and inexperience with the Moslem culture, I have not made inaccurate observations or made statements which might be offensive.

I would emphasize that the Egyptian people are warm, friendly, superb hosts. At no time did I feel unwelcome or unsafe.

## Dedication

I would like to dedicate this work, which helps to preserve some of the past and present of Egypt, to the children, the future of Egypt.



Children and their goat kid in Beni Suef--The future of Egypt.

## I. EXECUTIVE SUMMARY

### A. Description of Proposal

It was proposed to go into the villages of Egypt to observe the baking of village breads, to develop recipes for those breads, and to document through photographs the tools, the ovens, and the techniques used in making the breads. Some new varieties of grains developed by the Egyptian Major Cereals Improvement Project (EMCIP) were to be taken back to the villages for test baking and sensory evaluation of the breads made from them. One woman technician from the experimental bakery at the Agricultural Research Center in Giza, Cairo was to participate in the survey and sensory evaluations so that she would be trained to continue the work in the laboratory.

### B. Description of the Ongoing USAID Project

The on-going AID Project in Egypt with which this proposal was attached is the Egyptian Major Cereals Improvement Project. The overall objective of EMCIP is "...to improve research and extension capabilities related to modern production of wheat, maize, sorghum, barley, forages, and grain legumes, and to devise and implement a program to increase production of these cereals while taking into account the problems and opportunities characteristic of Egypt's general economy and its small-scale peasant farmer." Also "A need exists to collect information on the direct and indirect involvement of women as part of the family farming system. In particular, their roles in agricultural production, marketing, and in family care needs to be assessed." The request for assistance from the director further stated that there is a need to evaluate the role of women in the production of grains, particularly those grains used to feed rural farming families, to evaluate the nutritional content and baking qualities of the new varieties of wheat and maize currently being tested at the Cereal Research Laboratory, and to integrate such work with that of Dr. Ahmed Khorshid, with particular attention given to the women who are using the grains in baking, including an assessment of their attitudes toward the baking properties of these new varieties of grains.

As part of EMCIP, an experimental bakery was equipped for testing the wheat varieties for suitability in the baking of balady and shamy breads, as are baked in the government bakeries. The goals of the experimental bakery include the development of automatic bakeries for the balady and shamy breads, the improvement of the quality of the breads under the existing conditions at the bakeries, and ultimately, to decrease the waste of bread by improving the quality of bread or by making a more desirable kind of bread.

### C. A Brief Description of Findings

During the time spent in Egypt, the production of 19 different breads was observed and photographed. Information on several others was obtained. Breads from all-wheat flour included the fermented shamsy, balady, masri, mabattat, manottot, battatat and hanuun. Unfermented all-wheat breads included the Bedouin majordag and the Nubian fiti breads. Breads made mainly of wheat with a little maize flour included hanuun, amh and

nashif breads. Breads made mostly with maize flour plus about 10% wheat flour included the fenugreek containing mehrahra and battaw breads and the okra containing ra'rou' or mashtouah breads. Breakfast breads which contained wheat flour, butter, milk, sesame seeds, yeast, and which could contain eggs, dates or other ingredients included ara iish, orus and faish or zalout. Sorghum, which was not available, is used in a battaw bread and in the Nubian bread called senesen. Barley, which was not available, is used by the Bedouins in breads called mochamer and garassa. Fellahi contains wheat, rice and maize flours. Photographic documentation of tools, ovens and techniques were made for 19 breads which differ in ingredients or techniques of production. Formulations were documented for each of those breads.

Initially, it seemed that relieving the women of the rather large task of making the family bread would be of benefit to both the women and their family. However, after observing the baking of breads from Aswan to el Alemain it seems that it would benefit the women and their families more by making the flours available at a price competitive with the purchase of bakery bread. Some of the special flours--sorghum, barley, rice--were not available and so the baking of breads made from them could not be observed.

The use of crop residues as fuel for the ovens presents some problems. With all of the organic material being stripped from the fields, the soil must be losing its water-holding capacity as well as its mineral nutrients. The practice of storing the straw and cornstalks on the roof creates a haven for all kinds of vermin. It also creates an extreme fire hazard. As an example, a village near Alexandria was completely burned out as a result of a spark from the fire of a woman baking bread igniting the straw on the roof.

One possible area of research would be the development of a fuel efficient oven that burns kerosene or diesel fuel such as was seen at el Alemain. It is not clear what the economic impact of such an oven would be--whether the benefits gained by leaving the crop residues on the field would be equal or greater than the cost of the oven and the fuel.

There are many kinds of bread made in the villages of Egypt. Some of the formulations go back for many generations. Those that are made with sorghum and barley are not being used today because the flours are not available, or they are too expensive. Economic considerations may force many families to use bread from the bakeries rather than that made at home. This is especially true for the people who live in the villages but who do not farm and for all city dwellers.

## II. INTRODUCTION

### A. The Social Context

Bread is the mainstay of the diet of Egyptian people. Estimates suggest that as much as 70 to 90% of the food is bread. There is a saying in Egypt that once we have shared bread and salt, we are friends and nothing can come between us. Bread and salt are two basics for maintaining life in Egypt. The Arabic word for bread--aish--can be translated as life. Bread is life.

#### 1. The City

In the city there are no furns or ovens, other than in the government bakeries. Fuel is scarce and bread ingredients would have to be purchased. Bread from the government bakeries is sold at a very low price of 1 piaster per 169-g loaf of balady bread made with 87% extraction flour or per 125-g loaf of shamy bread. A 169-g loaf of balady bread made with 82% extraction flour costs 2 piasters. The workers in the bakeries are paid low wages so that skilled workers will not stay. The huge population creates the need for hasty mass production of bread. The result is production of bread of low quality and price. A farmer can purchase a cartful of bread for less than he can purchase a cartful of grain. Some farmers thus, feed bread to their farm animals. According to Khorshid about 30% of the bread produced by the bakeries does not go for human consumption.

In the city women are seen working in stores and shops, as maids and waitresses, and in almost every occupation. Wages are low, but equal, for both men and women. A large proportion of the men hold down 2 8-hour a day jobs. Egyptian men marry late--about 35 years of age--because they are expected to have their apartment completely furnished and decorated before they take a wife. When they do marry, they choose a young wife who may be only 16 years of age. Sixteen is the minimum legal age for a girl to marry. One obvious consequence is the large number of widows.

#### 2. The Farm

In the farm areas almost every home has its own oven. In many of the villages it would be totally unacceptable for the family to purchase bread from the bakery. Farm families have a source of fuel from the crop residues and from the droppings of the large farm animals (gella). If the farm grows grain crops, they have a source of ingredients for the bread. When there is no farm source for the fuel and grains, then these things must be purchased, which increases the cost of making bread at home.

Baking day is a social occasion where the extended family and friends or neighbors get together to help each other. The community aspect of baking was ritualized in Sentimeh. There, each baker in the village starts her sourdough on the same day. She places a bowl of flour and water out on the roofgarden. Each day she replenishes the starter by adding fresh flour and water. On baking day, the baker will visit each of her neighbors to get a piece of her starter. She mixes a piece of her own starter with what she has collected from her neighbors, and uses the mixture to leaven her bread. She always has enough starter to share with her neighbors.

Critchfield, in Cairo Today (Sept.-Oct. 1984) stated that the diet of the rural Egyptians had improved markedly in the past

10 years with the inclusion of more fruits and vegetables. The income level of the farmer has increased as well. Indeed, the rural population has become a consumer society with purchases of such goods as television sets, washing machines, sewing machines, tractors, and other consumer items.

The poor resource base in rural Egypt has resulted in the migration of the men to the cities and out of the country in order to work for money. Sometimes they take their family, but usually they do not. Many homes in the villages are uninhabited because the owners are working elsewhere. As a result of this lack of manpower, we find women involved in all of the tasks on the farm. Ishak et al (EMCIP Symposium Proceedings, 1984) have documented that women do everything including making major decisions about the farm.

### 3. Cultural Considerations

Egypt is primarily a Moslem country. In the villages this leads almost to a cloistering of the women. The migration of the men out of the country to work and the habit of older men marrying younger women leads to many women being in charge of the farm. In the study by Ishak et al (1984) 44% of the farms around Tanta (Gharbiya) were owned by women.

With the building of the high dam at Aswan, the Nubian people were displaced from their ancestral home. Many of them relocated in the Aswan area. The Nubian people have a strong tradition that their women do not work outside the home, and that the man provides the income. In the cities it has become necessary for some of the Nubian women to be gainfully employed. The Nubian people are honest, trustworthy and clean. They have been ideally suited for work in domestic service, the hotel industry, and as guards. Their peaceful nature makes them natural arbitrators. They are now well integrated into all levels of Egyptian Society. Even though they move to the cities, they maintain a strong identity and strong ties with their village. The book "Nubians in Egypt Peaceful People" by Fernea, Gerster and Jaritz (1973) gives an excellent synopsis of this aspect of Egyptian Culture.

The Bedouin people also have a strong tradition that their women do not work. In this case, it means that the women keep house, raise children, and prepare the food. In the past, they did not do farm labor--because they did not have farms. They do take care of the animals. Like the rest of Egypt, the Bedouins are undergoing a great change in lifestyle. The government is trying to get them to settle and has built homes for them. With the shift from a nomadic lifestyle, the roles of both men and women are changing. The camels are no longer used, therefore, the women do not need to weave saddle covers for them. Instead of pitching and striking the tents, the women must clean and organize a house. Instead of baking an unleavened bread on a portable griddle, the sourdough style balady bread is baked in an oven. Instead of subsisting on dates, milk products and meat, the diet has been improved by the addition of fruits, vegetables and more grains.

The Egyptian government is building a canal into the area

inhabited by the Bedouins. With the arrival of water, there will be a need for education on how to farm. Current farming in the area is dryland, non-irrigated production of grains. With the extended drought, there has been little grain production. As this change occurs, there will be a need for information on the actual roles of women in agriculture in this location. There is no doubt that the women would like to earn extra money. That desire is universal. The problem will be in understanding the particular cultural norms and in predicting how those norms will be affected by the rapidly occurring changes.

The Bedouin culture does not have the interwoven village social and financial relationships that have served to keep the Nubian culture intact in spite of being relocated, in spite of the migration of the men, and in spite of being absorbed into the greater Egyptian culture. It remains to be seen what will happen to the Bedouin culture and family structure in the face of such rapid change.

#### 4. Change

Big change started with the high dam. It made an end to the annual floods and the orderly cycle of life that coexisted with the floods. Now, instead of one crop per year, there are 2 or 3 crops. The high dam made more water available for irrigation. It also created an expanse of water suitable for the growth of mosquitos and bilharzia. It resulted in salination of the soil. It also provided electricity.

The availability of electricity made possible the use of conveniences and the transition from a producer to a consumer society. Families want television sets, washing machines, and sewing machines. The spread of television has given the peasants an awareness of a lifestyle they did not know existed and has created in them a desire for the finer life.

Everywhere there are building projects and efforts to increase mechanization and modernization. Computerized poultry farms coexist with factories for handmade oriental carpets. Tractors are seen in fields adjacent to fields being plowed with the aid of the water buffalo or with hoes. New concrete and brick houses are seen next to the mud and thatch houses of antiquity. Automobiles, motorcycles and trucks share the highway with donkey carts and camels. Irrigation canals are filled by means of the Archimedes screw, the sakkia, or gas powered pumps. The primus stove has replaced the clay cannon for stove-top cooking. Girls can be seen washing clothes at the water tap, in the canal, or with electric washing machines. Egypt is a land of contrasts where life goes on as it has for 6000 years and at the same time Egypt tries to pull itself into the 21st century.

Egypt has many needs. It needs to be self sufficient in food production. It needs to give minimal education to its people, especially the peasant women where there is a 95% rate of illiteracy. Extension efforts must be directed to these uneducated women who own and presumably operate 44% of the farms. Women want to be able to earn money. They want to learn good animal husbandry practices. They want to know the latest and best information to increase the yield of their crops. Women are involved in many decisions on the operation and management of the farms. They need information on which to base those decisions.

Much of the information on the role of women in agriculture is dated. So much change has occurred that roles of both men and women have been modified. Current information on the roles and needs of men and women is needed to provide a basis for extension efforts to increase Egypt's self sufficiency in food production. As this information is gathered, it must be kept in mind that there are some distinct sub-cultures like the Nubians and the Bedouins who are not considered "Egyptian" by the "Egyptians", even though they are residents and citizens of Egypt.

5. The Egyptian Major Cereals Improvement Project (EMCIP)

EMCIP provided office space, local ground transportation, and moral support. Dr. Coleen Brown, Assistant to the Chief of Party graciously gave me a place in her office to work. She provided me with background information on both the Egyptian culture and on the workings of EMCIP. The women's committee, Dr. Yeldey Ishak, Dr. Zeneb, and Naima Hassan, met with me to provide me with information about their women in development activities. They provided me with a summary of the surveys they had done in Tanta and Minya and accompanied me on visits there. (It was interesting to learn that the women extension workers who accompanied us on those days had never seen bread being baked in the villages.) Dr. Yeldey insisted that a schedule should be planned and maintained during my visit. Dr. Khorshid resisted, and no schedule was developed. Dr. Ahmed Khorshid, Director of the Wheat Quality Laboratory and Experimental Bakery, made arrangements for most other baking days. He, through the Agricultural Research Center in Giza, made arrangements for Dr. Hussein Ashour and/or Dr. Hassan Faraq Hassan to accompany me on most baking visits to act as interpreters.

6. Women in Development

There has been a lack of sensitivity to the needs of women in development projects. In order to increase the sensitivity to women's needs, and in order to provide experience for people interested in working in developing countries, the Women in Development Fellowship Project was designed and implemented. It was to complement projects currently in progress by the Consortium for International Development. Dr. Helen Henderson, Director of the Women in Development Fellowship Program, requested suggestions of possible projects from the Chief of Party in CID projects. The campus coordinators for WID contacted potential candidates on their campuses. Project proposals were presented to the Campus Coordinators and were forwarded to CID/WID for evaluation. Only through the grant funded by the WID Fellowship Program, release time given by the University of Idaho, and the assistances provided by EMCIP and the Agricultural Research Center in Giza, Cairo Egypt could this research project have been done.

It is worth noting that there are many highly trained Egyptian women. Their expertise is recognized and rewarded without regard for whether they are men or women. The EMCIP Project has a Women's Committee that is deeply involved in ascertaining the roles of women in agriculture in Egypt. In addition, it now has a woman American Chief of Party. This is possible because of the commitment of Dr. Momtaz to some of the concepts of Women in Development.

### III. METHODOLOGY

In the proposal, visits were to be for several days in each village so that the baking could be observed and documented using the available flours, and so that test baking could be observed using flours from grains developed by the EMCIP Project. The time in the village was to provide an opportunity to observe the people in their day-to-day activities. In consultation with Dr. Ahmed Khorshid, a listing of desired information was developed. Dr. Khorshid planned to go on all of the visits to the villages. He made arrangements for the baking days, although he was too busy to take the time to go to the villages. As time for the first baking trip approached, it became apparent that my Egyptian colleague could only make a day trip. He could not stay out overnight. I was then told that there would be no test baking of the grains produced by EMCIP. Dr. Khorshid explained that it was most important and urgent to document the formulations and techniques used in the baking of village breads because the current pricing policy of the government for bread and grains made it too expensive for people to continue baking their own bread, and thus, these techniques and formulations would soon be lost.

Dr. Khorshid also explained the bread problem in Egypt. In conjunction with Dr. Khorshid, a proposal aimed at developing an automated bakery for balady bread and for intensive research on the nature of the sourdough techniques used in the production of the balady bread was written.

#### B. Baking Day

The preparation and baking of the bread was observed from the sifting of the flour to the final baking. Photographs were taken to document each of the techniques and tools used. A tape recording was made of the interview. The baker was asked how much flour she used. The balance that was available had a maximum capacity of a little over 1 kilogram. The bakers often used 14 to 20 kilograms of flour, so that the balance was not helpful in assessing those larger quantities. The amount of salt and yeast was weighed, or if the balance was not available, the volume was estimated and the approximate weight calculated from the volume. The moisture content was estimated based on the knowledge that bread, as I make it, has a moisture content of 60%, and that shamy bread as made in Khorshid's Laboratory has a moisture content of 90%. On occasions, a further check of moisture content was obtained by multiplying the average dough weight per loaf times the number of loaves and comparing with the total estimated weight obtained by adding the weight of all ingredients plus the estimated water content. The baker was asked what she put into the bread and how much she used. Usually she knew, sometimes ingredients could be weighed on the balance, and sometimes it was necessary to make an educated guess. A cost analysis was made based on the cost of the flour which is set by the government at 0.125 LE per kilogram, salt, yeast, fuel at 1.00 LE per 20 kilograms of flour used, and on an allowance of 3 LE per 20 kilograms of flour used for the woman's time. The total cost was divided by the number of loaves to get the cost per loaf. Samples of the breads were taken back to Khorshid's laboratory to be weighed and dried. The dried samples were

ground up, packed in plastic bags and placed in the freezer. The women were asked how often they baked bread and how they stored the bread.

Usually the family that did the baking provided a lunch for the translator, the driver, and me. During the lunch information about the family and the culture was gained. Questions about the way the bread was usually consumed and what foods were eaten with it were asked. I was always asked what I was going to do about the price of flour.

One of the goals of the fellowship was to train a woman to do the sensory evaluations of the breads. Although there was a woman in Khorshid's laboratory she did not go on the baking days. It would not have been possible to train her since the test baking was not done.

Contacts were made with the Nutrition Institute. Dr. Dakhoury is very interested in the nutritional information that will be obtained from the bread samples that were brought back to the United States.

## IV. RESULTS

### TOOLS

The first tool for bread making is the sieve or marchol. Sieves are made of a hoop of thin wood with a mesh of plastic or silk, depending on whether it is a coarse or fine sieve. The next item is the mixing bowl or maguur. Most popular is a very large earthenware bowl. Generally, this bowl is large enough to handle a batch of bread made with 20 kg of flour. Mixing bowls of aluminum and copper were also seen. Smaller dishes or tisht made of aluminum were used. An aluminum tray was used in making fatier masheltit. Water was carried in a variety of containers ranging from a plastic jerry-can to aluminum bowls, plastic or glass pitchers. Flour was stored in many containers--an earthenware bowl with an aluminum bowl over the top, a square metal can, plastic bags, a basket and a clay jar called a zellua.

In some places the women worked at a low table called a tableea. It was used to shape the loaves and to hold the loaves while they fermented.

Shamsy bread is placed on a makrassa for fermentation in the sun. In Beni Suef, Luxor and Aswan they were made of gella--buffalo droppings. In New Valley and Assiut, they were made of clay mixed with straw. I was told that anything would work. Some bakers use wooden boards. In New Valley, plastic and china plates were used in addition to the clay makrassa. Usually a thick layer of bran is put down before the bread is placed on the makrassa. In New Valley, banana leaves were used to cover the makrassa. The baker said that the bread placed on banana leaves fermented faster than the bread placed on the bran.

In New Valley the baker had a magraffa or puller that her husband had made to move the bread around in the oven.

The shaping of flat breads is done with several tools. The most widely used tool is the matroha. The matroha was made of several materials. In Beni Suef, Tanta and New Valley, the large matrohas were made of palm wood. In Tanta, el Omaid and Sentimeh they were also made of strips of hardwood. In Sentimeh, the older matrohas were made of one large board cut in a circular shape with rings of small holes drilled in it. In el Omaid and Tanta, large plywood circles were seen. In Beni Suef and Assiut, small matrohas made of plywood were used to place the loaves in the oven. Smaller matrohas were used for balady and shamsy bread and larger ones for battaw and mashtouah.

In Dakahliya (el Omaid) the mabbatat was flattened by pounding with the hands, tossing on the plywood matroha, and finally, by being rolled. The roller or neshiva was seen in el Omaid, New Valley, Edfina, El Alemain and Burg al Arab. A knife or sikkina was used in el Omaid and Edfina.

The grains or legumes are ground either in a community stone mill or by means of the hand operated stone mill called a rahiya. The rahiya was seen in Durunka village.

Water jugs or zelluas are found outside homes in Egypt. Other things are stored in sealed jugs, such as grains or flour.

The manchol or sieve. They are similar to this all over Egypt, although these came from Beni Suef. The coarse sieve has a plastic mesh while the fine one has silk mesh.



The mixing bowl or maguur. Both earthenware and metal ones are used.



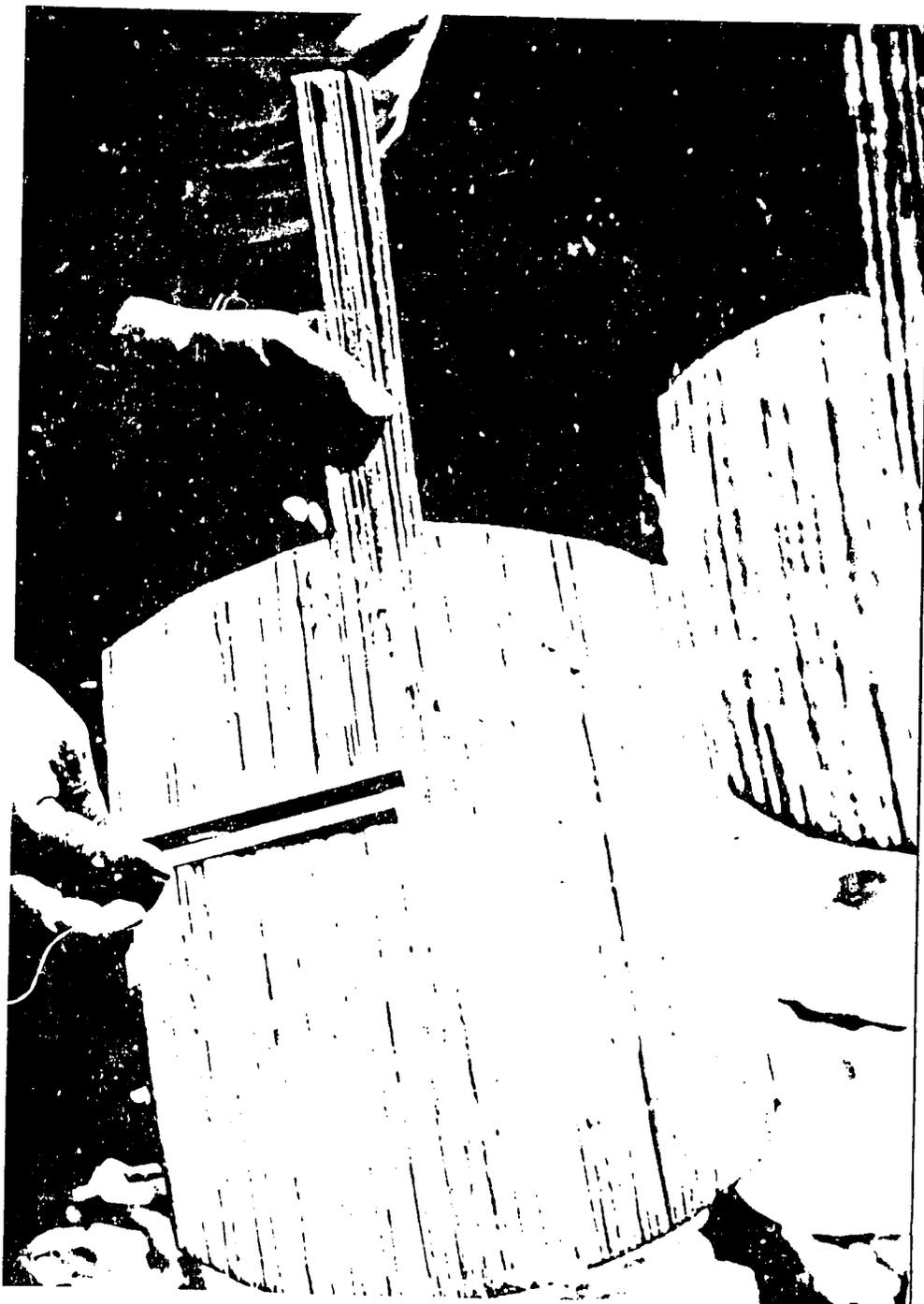
The makrassa is a disk that is covered with bran to hold the shamsy bread while it ferments in the sun. What material is the makrassa made from?





The magraffa or puller used to move the bread around in the oven.

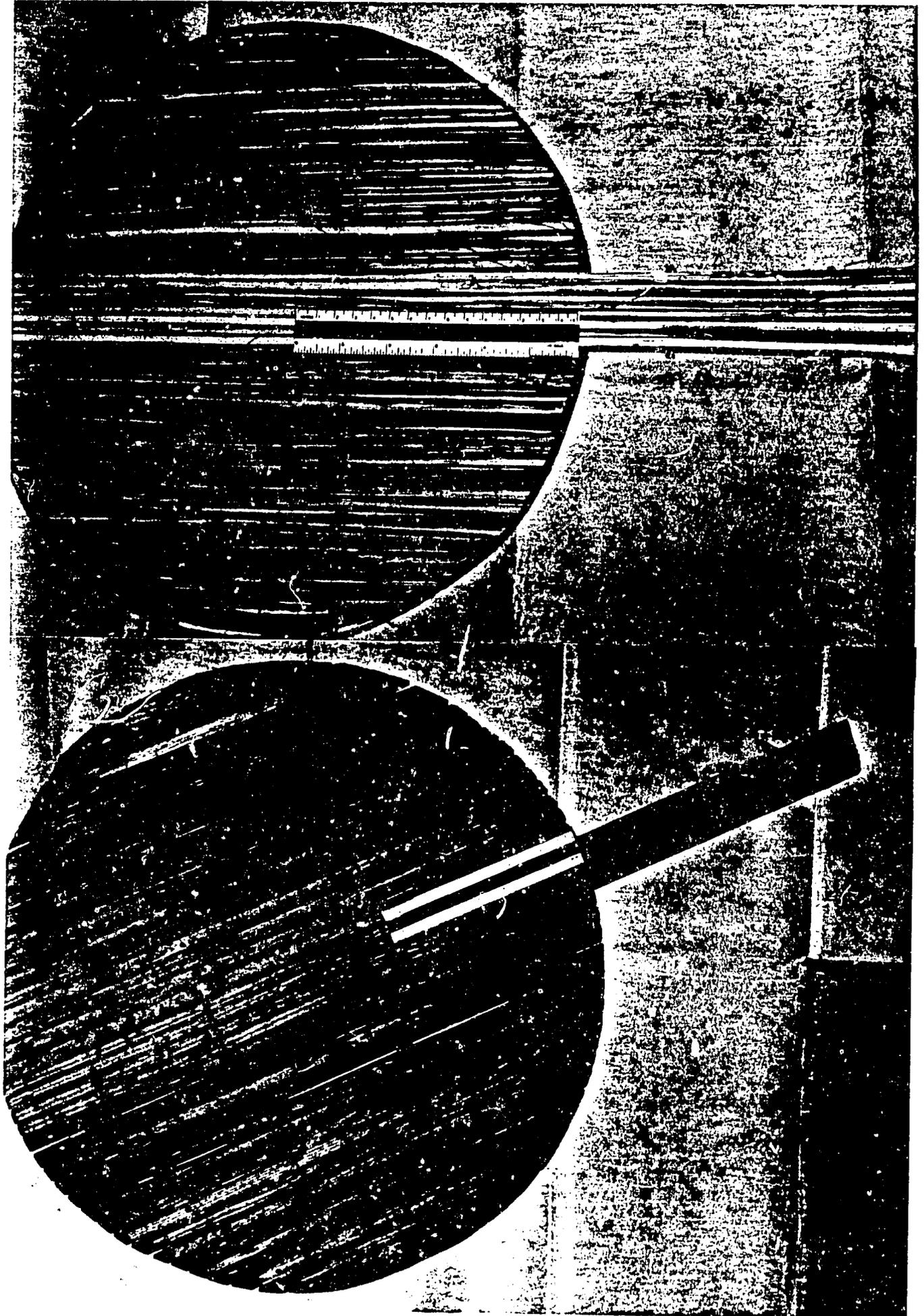
The matroha used for flattening the bread. These were made of the wood of palm fronds. They were in Beni Suef.



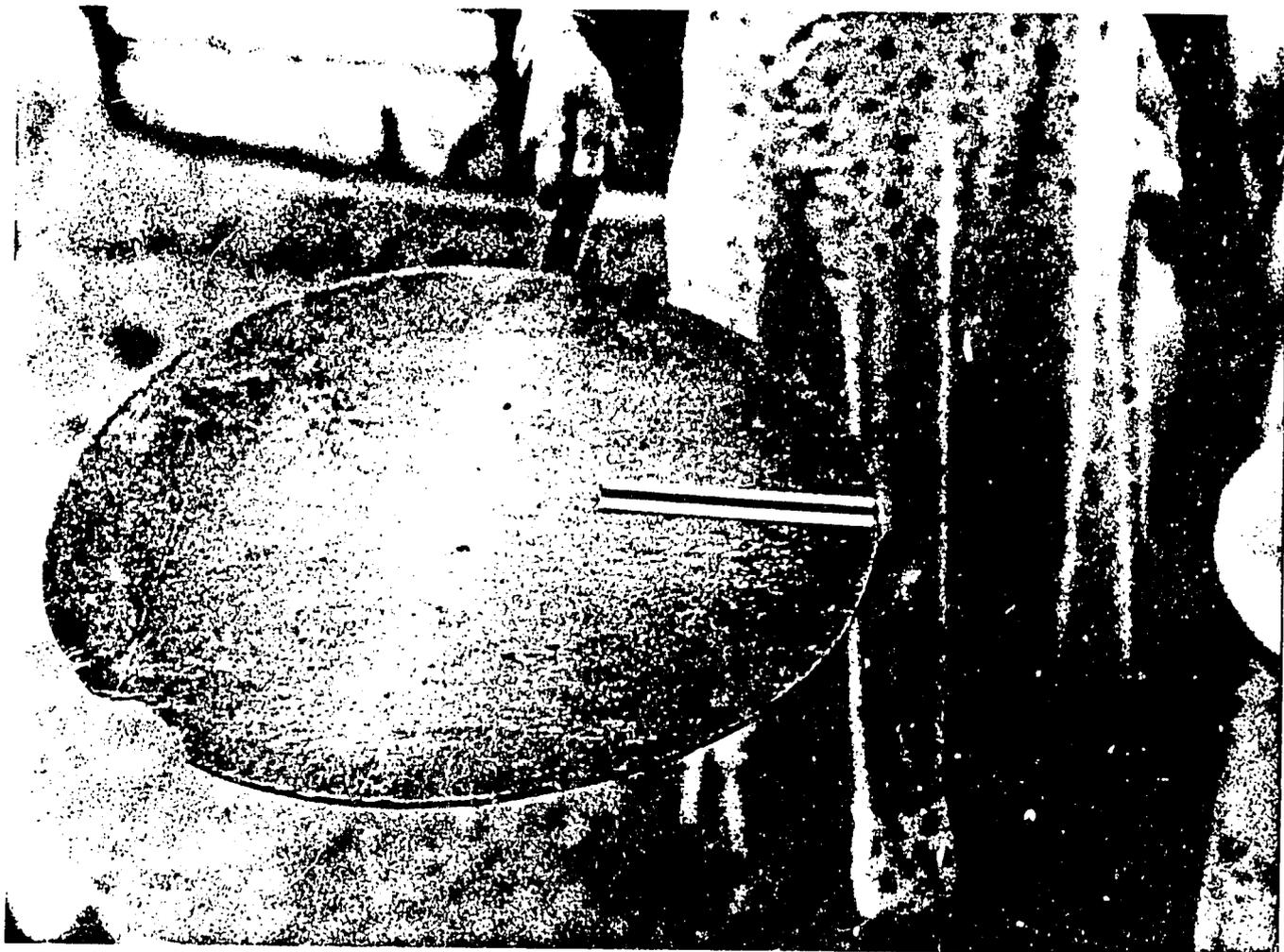
Old style matrohas from Sentimeh.



Newer matrohas from Sentimeh.



Plywood matroha from el Omaid.



The neshiva or roller is used to flatten the bread and the sikkina or knife is used to cut the bread.



The rahiya or stone mill. It is used for grinding grains and legumes. Large quantities of flour are ground at community mills.





The tisht or dish used in making fatier masheltit.



The tableea, a low table used for various techniques in the making of breads.

The zellua (zella in Cairo) or storage bottle. This one was for water but similar ones are used to store grain and flour.



Graneries on top of the house and on the ground by the house.  
Note the corn stalks and straw on top of the house.



## OVENS

In rural Egypt almost every home has its "furn" or oven. The location of the oven, its shape, type of hearth and size of hearth opening are dictated by the space available, the type of bread made, the materials that are available and the region of Egypt.

In upper Egypt round ovens were seen. They might be shaped like a hemisphere, as seen in Beni Suef. They might be shaped like a truncated cone, as seen in Assiut, or a kind of barrel shape as seen in Luxor. From the viewpoint of efficiency for the baker, the hole for fuel should be below and to the right of the hearth opening for a right handed baker. It should be below and to the left of the hearth opening for a left handed baker. Less efficient arrangements are with the hole for fuel located at 90° or 180° from the hearth opening.

In upper Egypt the preferred bread is shamsy. Shamsy is baked for a longer time than the thin flat breads, and thus, must be baked at a lower temperature. In New Valley, it was baked with the residual heat in the oven after the fire stopped blazing. With the lower temperature baking, it is not necessary to continuously feed the fire, and it is not necessary to continuously watch the bread. Thus, it is possible for one woman to bake, even when the hole for fuel is 90° or 180° away from the hearth opening.

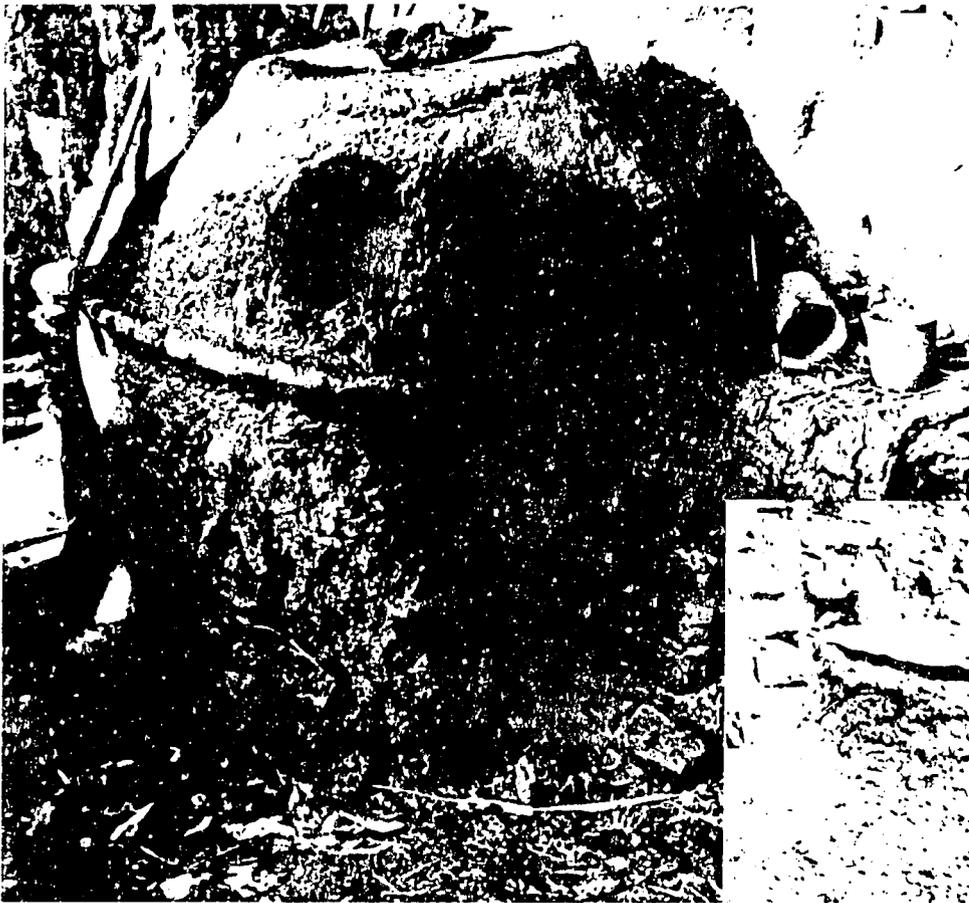
Many rectangular shaped ovens were seen. They had a clay or iron hearth, depending on the type of bread that was baked, and on the availability of materials. The clay hearth is hotter than the iron hearth, and is preferred for the mehrakra, battaw, and mashtouah breads. Those flat breads also dictate that the hearth opening will be very wide.

The choice of fuel was made not only by the availability, but also by the burning characteristics of the fuel. Chopped cotton stems, rice stems, or maize stalks made a quick, hot fire suitable for the thin breads. Gella or whole maize stalks also make a hot fire, but not as hot as the chopped stems. Wood and palm fronds make a cooler, more even temperature suitable for the lower temperature and longer cooking required for shamsy bread. In el Alemain, where there is not much organic material available to use as fuel, the oven was heated by either kerosene or diesel oil.

The wide-hearth, rectangular shaped oven used for battaw bread.  
This one was in Magousa, Tanta.



The front and back view of an oven in Luxor. Note the circular shape and the decoration near the opening for fuel. This oven is not efficient for the woman to use since she must go from one side of the oven to the other as she adds fuel and puts bread into the oven or removes bread from the oven.



A double oven near Sentimeh.



A double oven in Durunka, Assiut. This is also an inefficient oven for the woman since the hole for fuel is at one end and the hearth opening is near the opposite end of the oven.



Oven in Durunka, Assiut. The small hearth opening is for shamsy bread. Note the kettles sitting on top of the oven. There are holes in the top of the oven so that the oven's heat can be used for stove-top cooking.



Hemisphere-shaped oven in Beni Suef. This one was used for shamsy and balady breads.



Rectangular oven in el Omaid. Note the iron hearth and the chicken. The fuel here is rice straw.



Inside oven in Edfina. Rice straw is the fuel and fellahi is the bread being baked.



Truncated cone shaped oven in New Valley. Palm wood and fronds are the fuel.



Oven that burns kerosene or diesel oil. This oven belonged to the bedouins at el Alemain.



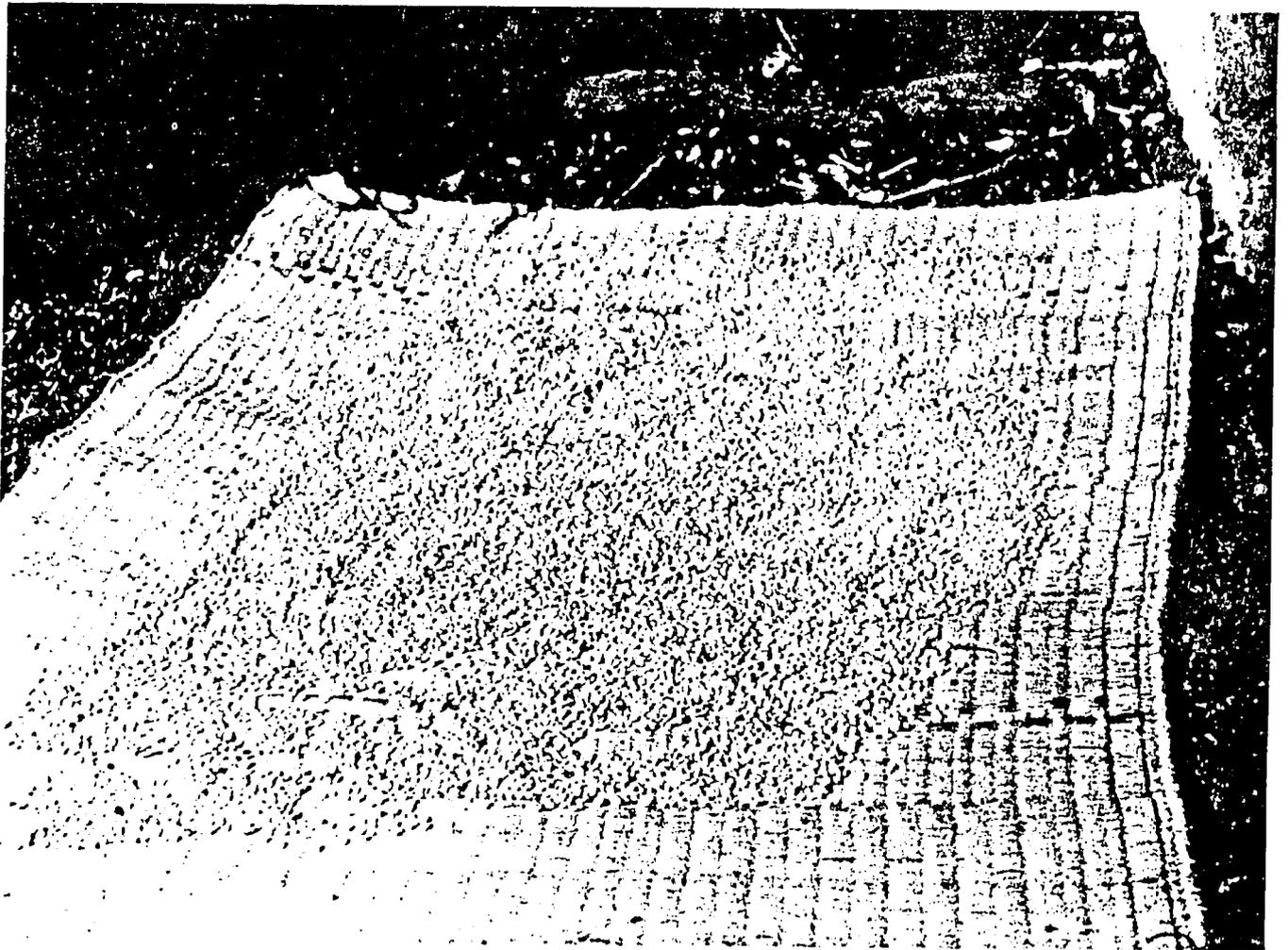
Rectangular oven in Fayoum used for manottot bread. Note the layer of small gravel on the hearth.



## The Mill

A stone mill was visited at Kafr Kazel, Tanta. Prior to taking the wheat or maize to the mill it must be dried to less than 12% moisture. The grains will be spread on a mat in the sun to dry. The mill is powered by electricity. It is made up of two large circular stones. There are grooves chipped into the opposing faces of the two stones. There is a hole through the center of the top stone. The grain is fed through a funnel into that hole. As the upper stone goes around the grain is ground and the flour comes out the outside edge of the stones and is carried on a conveyer to a bag filling spout. The flour is carried to a sifter where it is separated into 82% extraction flour and the sinn bran and the coarse bran.

Grain in the sun to dry.



Carrying the grain in a basket.



Pouring grain into the funnel



Waiting for the flour to grind.



Wholemeal being bagged.



Maize bran and maize flour.



## Sinn Bread

### Dokki Bakery

As a counterpoint to the production of village breads, the working of a small government bakery is presented. The Dokki Bakery is a small, but highly respected government bakery in Dokki, a section of Cairo. Sinn bread is an "all bran" bread that was developed for use in calorie controlled diets--especially for diets for diabetic people. It has a tan color, and the sample we obtained had a sweet, nutty flavor. The baker told us that some customers prefer the sinn bread dried.

### FORMULATION

Ingredient	Amount
Bran	100%
Flour (72% extraction)	10% (Imported Wheat Flour)
Sugar	1%
Salt	1%
Fresh Yeast (Compressed)	1% (From Alexandria)
Vegetable Oil	0.5%

The fresh compressed yeast, "biira", is produced in Alexandria and is preferred because it has more activity and gives better flavor than dry yeast. The sinn bread is made into round, flat, disk-shaped loaves, or into elongated "French-bread" type loaves. The elongated loaves are sliced and the slices returned to the oven to be dried. As an added bit of information, the manager of the bakery visited me at the EMCIP headquarters to tell me that the sugar should not be used in the product but that the baker added it to stimulate the yeast activity.

### PROCEDURES

The ingredients are poured into the bowl of a large electric mixer. Water is added to a level of about 60%, the exact amount determined by the judgement of the baker. The dough is mixed until the baker decides it has been mixed enough. After mixing, the dough is turned into a large wooden trough for a primary fermentation period of 1 hour.

After the fermentation period, the dough is divided and scaled by hand. The baker scoops out a ball of dough and shapes it either into a ball or a roll. The size of the loaf is checked by occasionally weighing a loaf on a double pan balance that is placed on the table near the baker. The ball shaped loaves are flattened using a wooden roller. The shaped loaves are placed onto a bran coated wooden tray. The tray has deep sides, and when the trays are stacked on top of each other, they serve as a fermentation cabinet. The loaves are fermented for 1 hour after dividing and shaping.

Following the final fermentation, the trays of loaves are transferred to a large table in front of the ovens. The ovens are gas-fired, two-stage ovens. The loaves are placed onto a long paddle called a peel. The peel is used to transfer the loaves into the oven. The loaves are baked for 3 to 5 minutes at 450° to 500° centigrade. The loaves are removed from the oven

using a second peel. The loaves are placed in cardboard boxes to cool. They are sold directly from the bakery and are not packaged to preserve freshness.

The long shaped loaves are sliced and the slices returned to the oven to dry them and toast them. The dried slices are put into cellophane bags.

The mixer.



The divided bread being shaped into loaves.



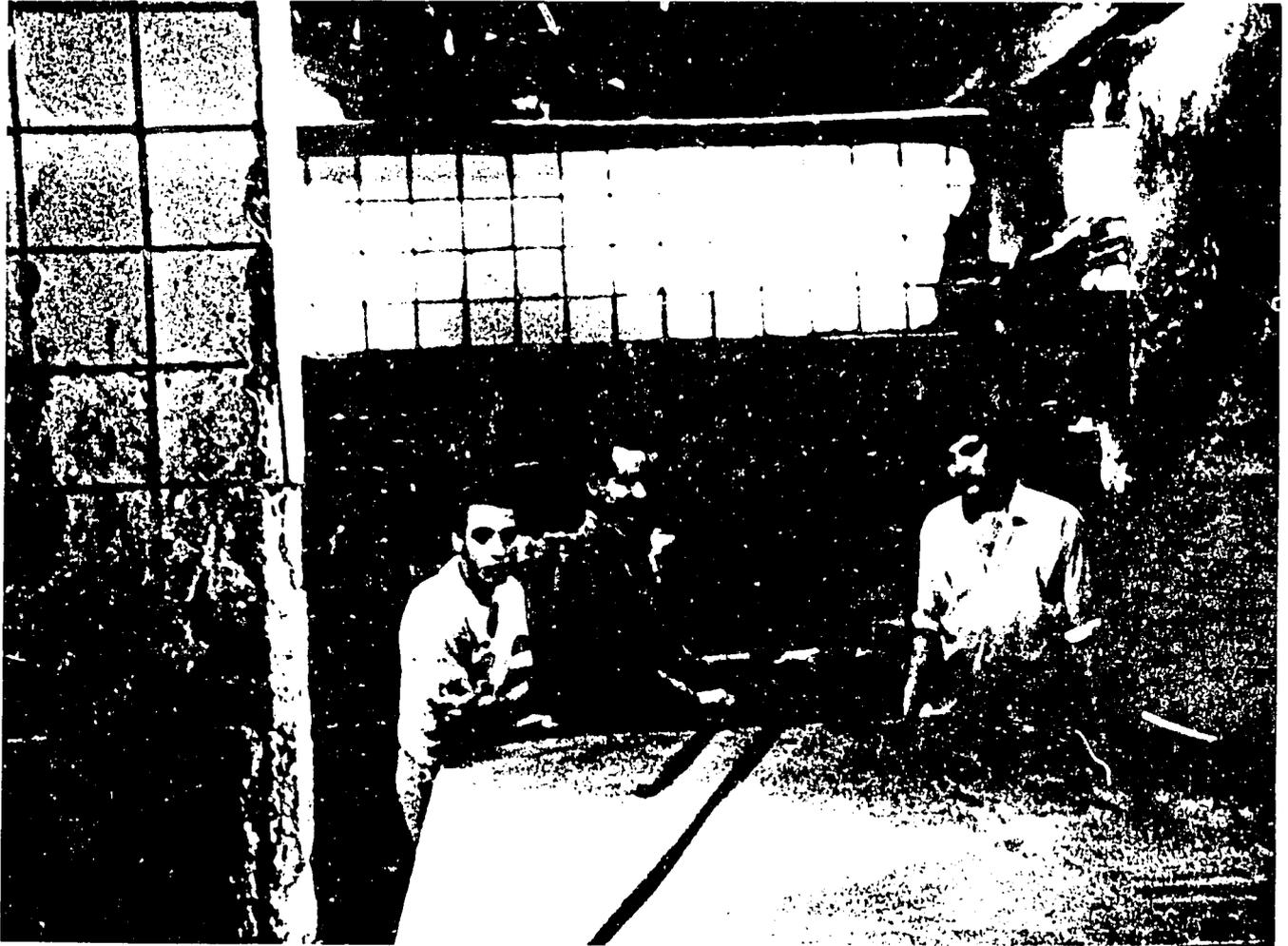
The long "French-type" loaves.



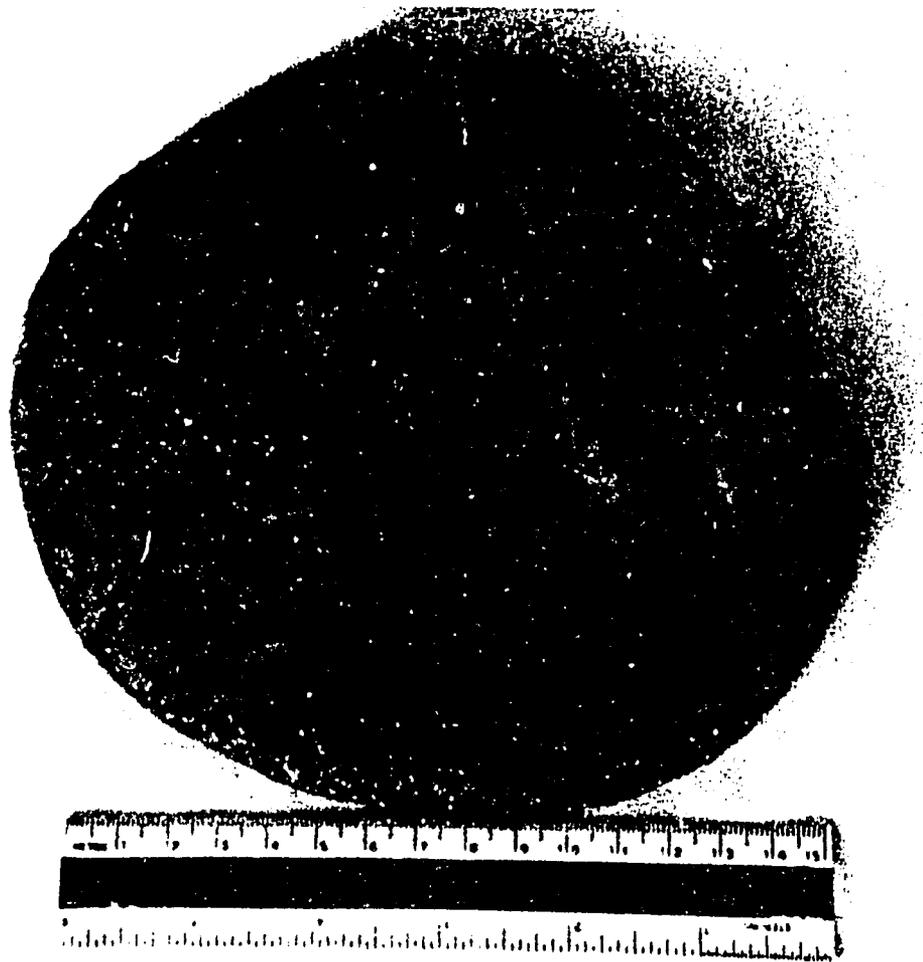
The disk-shaped loaves.



The oven.



The bread.



## SHAMSY AND BALADY BREAD

Beni Suef--Gamila and Rasheda

The word "shamsy" comes from the Arabic word for sun, shams. The production of shamsy bread utilizes the heat of the sun's rays to promote the raising of the loaves and to promote the formation of a skin on the surface of the unbaked loaf. The word "balady" comes from the Arabic word for country, local or native. It is the people's bread. Baking day is a social event in the village. That was apparent from the number of women who came into the house during the baking of the shamsy and balady breads. These women who baked for me earn some small income by baking for their neighbors. They told me that flour is so expensive and so difficult to obtain that they do not bake much anymore. The flour that was used for this bread was obtained from the black market at a very high price.

### INGREDIENTS

ITEM	AMOUNT
Wheat Flour (72% Extraction)	3 kg (imported flour)
Wheat Flour (82% Extraction)	2 kg (local wheat)
Salt	32 g
Yeast, Compressed	10 g (Alexandria)
Water	75 - 80 %

### TOOLS

ITEM	ARABIC NAME	MATERIAL
Sieves	Manchol	Wood frame, plastic silk mesh
Mixing Bowl	Maggour	Fired Clay
Paddle	Matroha	Palm Wood
Tray	Maggour	Galvanized Metal

### OVEN

The oven had the shape of a hemisphere with an opening in the top for smoke escape, a hole in the side for access to the hearth, and an opening on the bottom for introducing fuel into the fire. There was a sheet of metal which was used as a door for the open hearth. The oven was made of clay mixed with straw and gella. There were stones placed over the hole in the top. The oven was located in the back yard. The fire was fueled for the shamsy bread with wood and for the balady bread with gella. The gella is mixed with straw and formed into round briquettes which sell for 0.01 LE per 10 chips. A batch of bread made from 4 kg of flour requires 10 chips.

### PROCEDURES

In preparation for making the bread, the mixing bowl was cleaned by adding some water and scraping the residue with a wooden scraper. The flour was sifted into the large bowl. Some water was added and the dough mixed by hand. The salt was mixed with water, added to the dough and mixed in by hand. The yeast was mixed with water and added to the dough. More water was added and mixed in to form a slack dough of approximately 75-80% moisture. The baker said that she determined the amount of water

by cutting her hands through the dough--a measure of the viscosity and gluten strength. A bowl of flour and a bowl of bran were placed next to the baker. She placed some bran on a makrassa. Then she scooped a handful of dough out of the bowl, dipped it in the flour, then tossed it into the air and caught it in the same hand to form a round ball. The ball of dough was placed on the bran-coated makrassa and flattened. The makrassa containing the dough was placed in the sun for 1/2 hour to ferment and to form a skin on the dough. The dough was turned over and allowed to ferment for another 1/2 hour. The dough was then brought into the house for 15 minutes. Before baking, the loaves were pricked in four places with a stick. The ball was pressed to force the soft dough out of the holes, forming four knobs, and giving the loaf a cross-like shape. The loaf was placed on the matroha and tossed to flatten it a little bit. It was then flipped onto the hot hearth of the oven.

After 12 loaves had been put into the oven, the metal plate was put over the door to keep the heat in. The bread was baked for about 3 1/2 minutes. The door was removed from the oven and the loaves were tested for doneness. Those that were done were removed from the oven using the metal rod. Those that were not done were left close to the door for further baking. The baked loaves were removed from the oven and placed on a braided cotton rug to cool. After all of the bread had been baked, the shamsy was cut in two pieces and placed back in the oven to dry out. The dried shamsy can be stored indefinitely, if protected from insects, rodents, or other things that might eat it. This shamsy bread was a heavy, dense sponge-type of loaf with a lightly tanned crust and with dark brown spots on the bottom. Fuel was added to the oven to keep a fire burning at all times during the baking. One unbaked loaf of the shamsy bread weighed 320 g and one baked loaf weighed 267 g.

After the dough for 12 loaves of shamsy had been removed from the bowl of dough, more water was added to the dough to give a very slack dough of 95-100% moisture. Flour was sprinkled over the top of the dough and a cross formed on the surface. The cross was made "to invite God's help in making the dough rise". This dough was allowed to ferment for 1 hour. It was then divided and shaped into thin, flat, disklike loaves. After resting for about 15 minutes, the loaves were tossed onto a matroha. The dough was repeatedly tossed with a spinning motion using the matroha. The tossing caused the dough to flatten out into a thin circle. The flattened loaf was flipped onto the hot hearth. After 1 1/2 minute of baking, the loaf was turned over with the metal rod. The bread was baked for 1/2 minute longer, then pulled from the oven and placed on the braided cotton rug to cool. This balady bread had two crusts with a thin crumb layer with medium sized cells. One loaf of the unbaked balady weighed 273 g and one loaf of the baked balady weighed 157g.

#### COST

ITEM	COST IN LE
Woman	0.85
Fuel and Oven	0.15
Ingredients and Milling	1.21
TOTAL	2.21

This batch of bread would make 28 loaves of shamsy bread at an estimated cost of 7.9 piasters per loaf, or 2.96 piasters per 100 g of bread. It would make 36 loaves of balady for an estimated cost of 6.1 piasters per loaf or 3.9 piasters per 100 g of bread.

Cleaning the bowl.



Adding the flour.



Sifting the flour.



Adding the water.



Mixing the dough.



Dividing the dough.



The loaves in the sun to ferment.



Pressing on the loaf to form the horns.



Ready for the oven.



The bread in the oven.



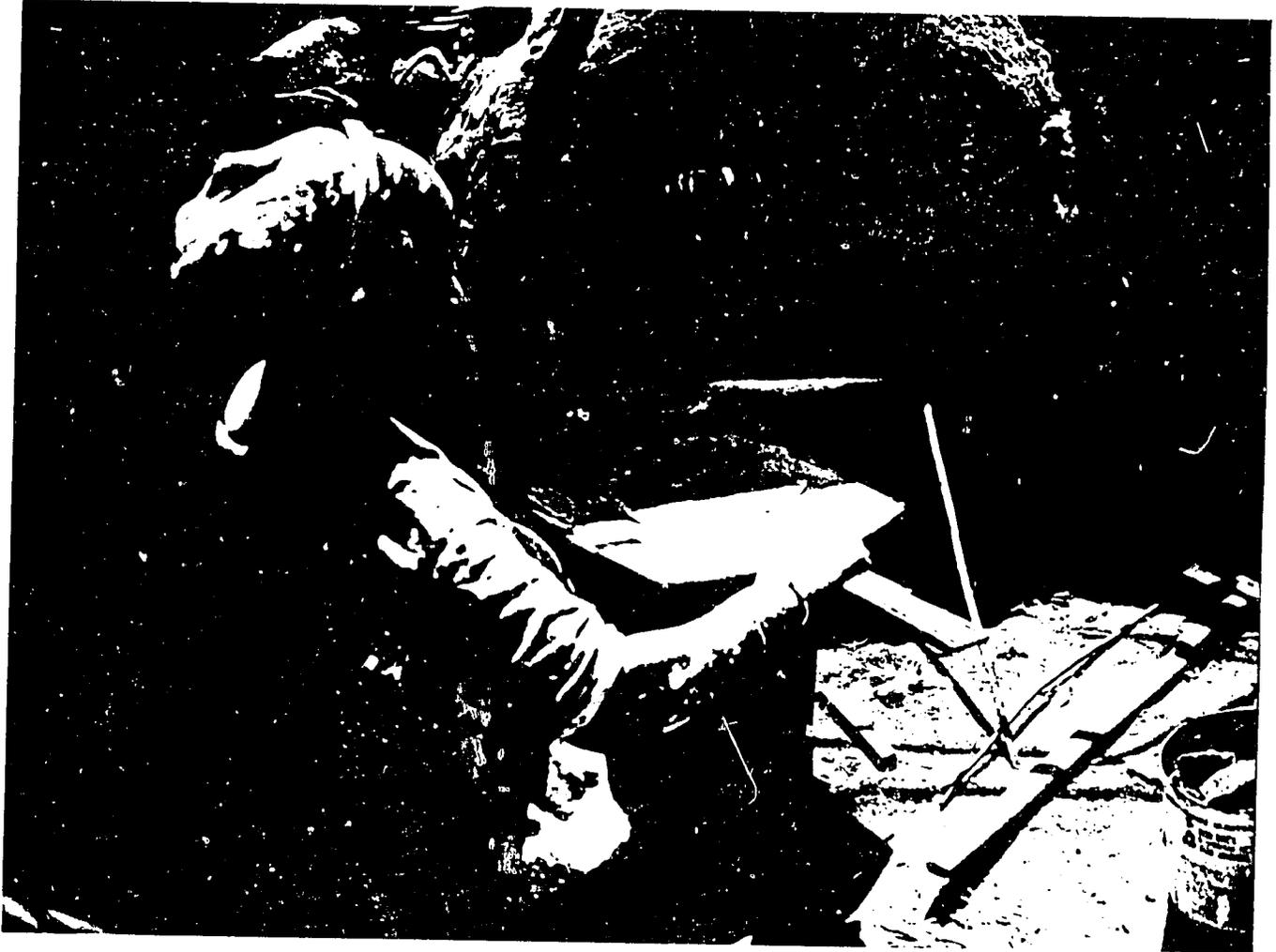
Baking the shamsy bread. Note the metal sheet over the hearth opening to hold the heat in during the baking.



The finished shamsy bread.



The balady bread on the matroha.



Flattening the balady bread with the matroha.



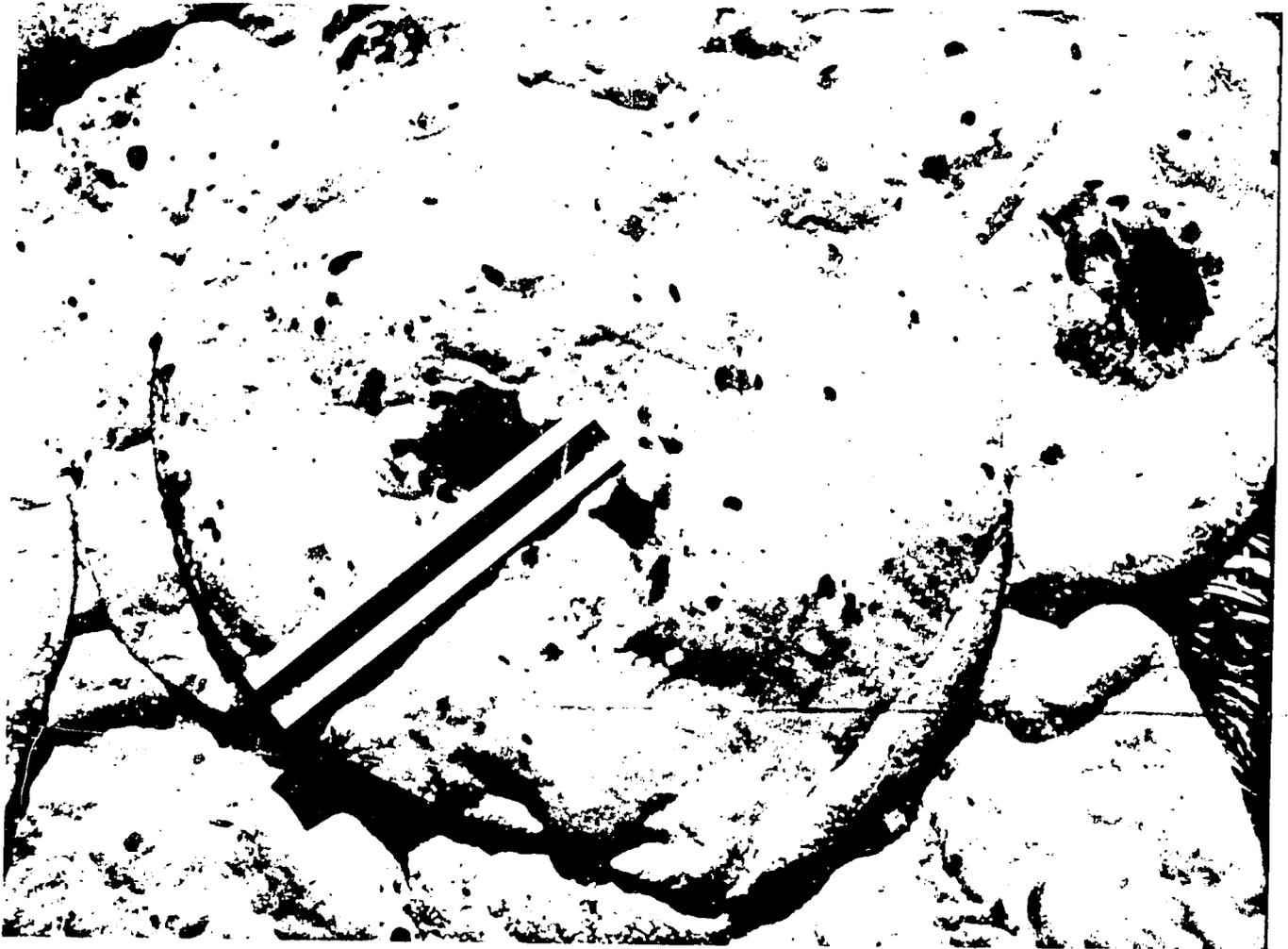
Placing the balady bread in the oven.



Baking the balady bread.



The finished balady bread.



## SHAMSY

### ASSIUT--Durunka Village

#### INGREDIENTS

ITEM	AMOUNT
Wheat Flour (82%)	20 K
Salt	200 G
Sour Yeast	
Water	70 %

Chamiira, or sourdough from the previous baking is mixed with 1 K of flour and water to about 80 % and is allowed to ferment overnight.

#### THE OVEN

Several ovens were observed in Durunka. In general, the ovens here were larger than seen in other places. They may have served several families, rather than just one family. The smallest oven was about 1 meter high and fit into a corner. It was flat on top and the top was being used for stove-top cooking. The hole for adding fuel was to the left of the hearth opening and at a 90° angle from the hearth opening.

A second oven was about 1.5 meters high by 2 meters long by 1.5 meters deep. It was also fit into a corner. The top was flat, but there were no holes on top to allow stove-top cooking. The smoke escape was about 1/3 of the distance down from the top. The hearth opening was near one end of the long side of the oven and the opening for fuel was to the left and at the other end of the long side of the oven.

The third oven was designed to permit stove-top cooking. It was square in shape with the hearth opening and the opening for fuel at 90° from each other. The oven was 1.5 meters high and about 1 meter square. It was in a corner, but not inside.

The starter was prepared the night before baking. The chamiira, or starter, left from the previous baking was mixed with flour and water and allowed to ferment overnight. The next morning, additional flour and water were added to the sourdough. The salt was added and the mixture punched and scrubbed to make a homogeneous mixture. When the correct water level was reached, the baker kneaded the dough by dubbing. The dough was allowed to rest (ferment) for 15 minutes, then was divided and shaped into balls. The balls of dough were placed on a bran-covered makrassa and placed in the sun to ferment. They were allowed to ferment for 40 minutes.

The baking was done for about 15 minutes, thus the oven was not as hot as for flat breads. There were brown spots on the loaves which suggest that the fire was hotter than desired for the best quality of bread. Before baking, a cut was made around the circumference of each loaf. This allowed the loaf to "oven spring" when placed in the hot oven, and prevented the formation of a pocket in the bread.

There were many women baking shamsy bread in Durunka during my visit. The bread on makrassas were placed on the ground, on

porches, and on tables in the sun. The smoke from the many ovens filled the air. At a cost of 2.62 LE for ingredients and 4 LE for fuel and the woman's time, this batch made about 100 loaves at an approximate cost of 6.6 piasters per loaf or 2.4 piasters per 100 g.

Mixing the dough.



Dividing the bread and placing the loaves on bran-coated makrassas.



Shamsy bread in the sun to ferment.



## SHAMSY BREAD

### LUXOR

#### INGREDIENTS

ITEM	AMOUNT
Wheat Flour (82%)	15 K
Sour Yeast	
Salt	150 G
Water	

#### TOOLS

ITEM	MATERIAL
Makrassa	Gella
Matroha	Plywood
Maggour	Galvanized Metal

#### THE OVEN

Location	Outside
Material	Bricks with clay-straw covering
Hearth	Clay
Fuel	Anything that burns

#### OPERATIONS

The night before baking the sour yeast is prepared. Commercial compressed yeast is dispersed in water, flour is sifted over the top, then is mixed in. The chamiira is allowed to ferment overnight. The next morning water, flour, and salt are added and mixed in by pulling the dough from the edge of the bowl to the center and by punching. The bread is kneaded by dubbing. The dough is allowed to rest for 15 minutes without turning the loaf. Before baking, 3 holes are torn in the loaf and the loaf pressed to extrude the dough and form 3 horns. I was told that the 3-horn shamsy is different from the 4-horn shamsy, but did not find out how they might be different.

This oven was small and was barrel shaped. There were 3 holes on the flat top that are used for stove-top cooking. The hearth opening and the opening for fuel were 180o from each other. This is an inefficient design for the baker who must get up and go around the oven to add fuel. However, since the baking of shamsy is a long time, lower temperature baking than for the flat breads, it is possible for one woman to do the baking. A batch of this size would make about 80 loaves at a cost of 1.99 LE for ingredients and 3.00 LE for the woman's time and for fuel. One loaf would cost 6.2 piasters or 2.1 piasters for 100g.

## SHAMSY BREAD

NEW VALLEY--Kharga

### INGREDIENTS

ITEM	AMOUNT
Wheat Flour (82%)	5 K
Wheat Flour (72%)	10 K
Sour Yeast	
Salt	150 G
Water	65-70 %

### TOOLS

ITEM	MATERIAL
Maggour	Fired Clay
Baskets	Woven Palm Fibers
Matroha	Plywood
Magraffa	Wood
Tray	Metal

### THE OVEN

Location	outside
Material	Bricks with clay-straw coating
Hearth	Clay
Fuel	Palm Fronds
Shape	Truncated Cone

### OPERATIONS

The night before baking the sour yeast was prepared. The yeast or chamiira from a previous baking was dispersed in water with a small amount of fresh flour. It was left to ferment overnight.

The next morning more water was added and flour sifted into the bowl. The bread was mixed first by pulling the dough from the edge of the bowl to the center of the bowl and punching it down. After the dough was mixed it was kneaded by dubbing. Dubbing is a technique of cutting the hands through the dough, lifting it and throwing it into the far side of the bowl. The dough may form a large air bubble and produces the characteristic "dub" sound. This technique stretches the gluten and incorporates oxygen which helps in the development of the gluten network. The baker tested for the completion of kneading by pinching the dough between her thumb and forefinger, then pulling the thumb and finger apart. When the dough is sufficiently developed, strings of gluten form between the thumb and finger.

After kneading, the dough was allowed to rest for 5 minutes. It was then divided and shaped. The baker scooped a large ball of dough out of the bowl, dipped it in flour, placed the floured part of the ball in her left hand and pulled and squeezed the uncoated part of the ball in her right hand to form a smooth ball. The ball was dropped onto a makrassa that was covered with either bran or a banana leaf. The makrassa was made of a mixture of straw and clay. It was heavy when lifted in the hand. The

loaves were flattened by pressing with the fingers, and then were placed in the sun to ferment. They were allowed to ferment for 30 minutes and were then taken into the house in order to slow down the fermentation while the oven was prepared for baking.

A cut was made around the circumference of each loaf. The cut allowed the bread to continue to rise and to "oven spring" without forming a pocket or rupturing the skin that formed on the loaf during the fermentation in the sun. It also allowed part of the steam to escape during baking. The bakers said that bread placed on the banana leaves ferments faster than bread placed on a layer of bran. The loaves of bread were not inverted during fermentation.

A fire was built in the oven from palm fronds and palm wood. After the oven was hot and the wood mostly burned, the hole for introducing fuel was covered and the loaves were placed in the oven. The oven was large enough for 12 large loaves. The banana leaves were left on the bottom of the loaves during baking and may have helped to prevent the formation of dark brown spots on the bottom crust. A long handled plywood matroha was used to introduce the loaves into the oven.

The door was placed over the hearth opening after all loaves were placed in the oven. They were baked for 9 - 10 minutes, then the door was opened and the loaves were checked for doneness. The door was closed and the baking continued for another 8-10 minutes. The loaves were moved around in the oven using the wooden magraffa. Each loaf was pulled from the oven and thumped to test for doneness. A loaf that was done gave a hollow sound when thumped. In addition, each loaf was lifted to test for heaviness. A heavy loaf was returned to the oven for further baking. This was a lower temperature, long time baking, as compared to the hot fires and ovens used for the thin flat breads. In fact, the bread was baked with the residual heat left in the oven after burning the palm fronds and palm wood. The fire was built up between each ovenload of bread, and each load of bread baked in the residual heat of the oven after the flames had died down. The finished bread was golden brown. When this bread is eaten fresh it is sliced. For storage, the bread is cut into 2 pieces and returned to the oven to be dried. This batch would make 73 loaves of the 340 g unbaked size at an estimated cost of 8.8 piasters per loaf or 2.9 piasters per 100 g.

This bread had a delightful, light, spongy crumb. This was a low-salt bread and the lack of salt was apparent in the flavor. The chamiira or sour yeast for the next baking was prepared by adding flour to the residual dough left in the bowl and rubbing it down to form a semi-moist mass. This starter was wrapped in a newspaper and placed in a small covered basket for storage.

Discussion about the role of the sun revealed that when there is no sun the bread is placed in a heated room to rise. Temperature is at least a significant effect of being in the sun. Since the bread is not covered it is a low-humidity fermentation. This low-humidity and exposure to the sun creates a skin on the surface of the bread.

The shamsy bread at New Valley was the lightest and most flavorful of the four shamsy breads sampled. The differences include: Kneading by dubbing in New Valley, Luxor, Assiut, and

Aswan, and kneading by folding and punching in Beni Suef. Fermentation was for 1 hour in Beni Suef, 40 minutes in Assiut, and 30 minutes in Luxor and New Valley. The loaves were inverted in the sun in Beni Suef and Aswan. The baking was at lower temperature and for a longer time in New Valley and Luxor and was at a higher temperature for a shorter time in other locations. The dough at New Valley was of lower moisture content than at the other locations. In Beni Suef, Luxor, and Aswan the makrassa was made of gella while it was made of clay and straw in New Valley and Assiut. In Assiut, New Valley and Aswan the loaves are slit around the circumference. In Beni Suef the loaves had 4 horns and in Luxor 3 horns. In Beni Suef the yeast was commercial semi-moist yeast. In Luxor, Assiut, New Valley, and Aswan chamiira was prepared from wild yeast or wild yeast + compressed yeast. In Beni Suef and New Valley part of the flour was imported flour, with the shamsy bread in New Valley having the highest proportion.

Mixing the dough.



Kneading by dubbing.



Dividing the bread.



Placing the loaves on bran-coated makrassas to ferment.



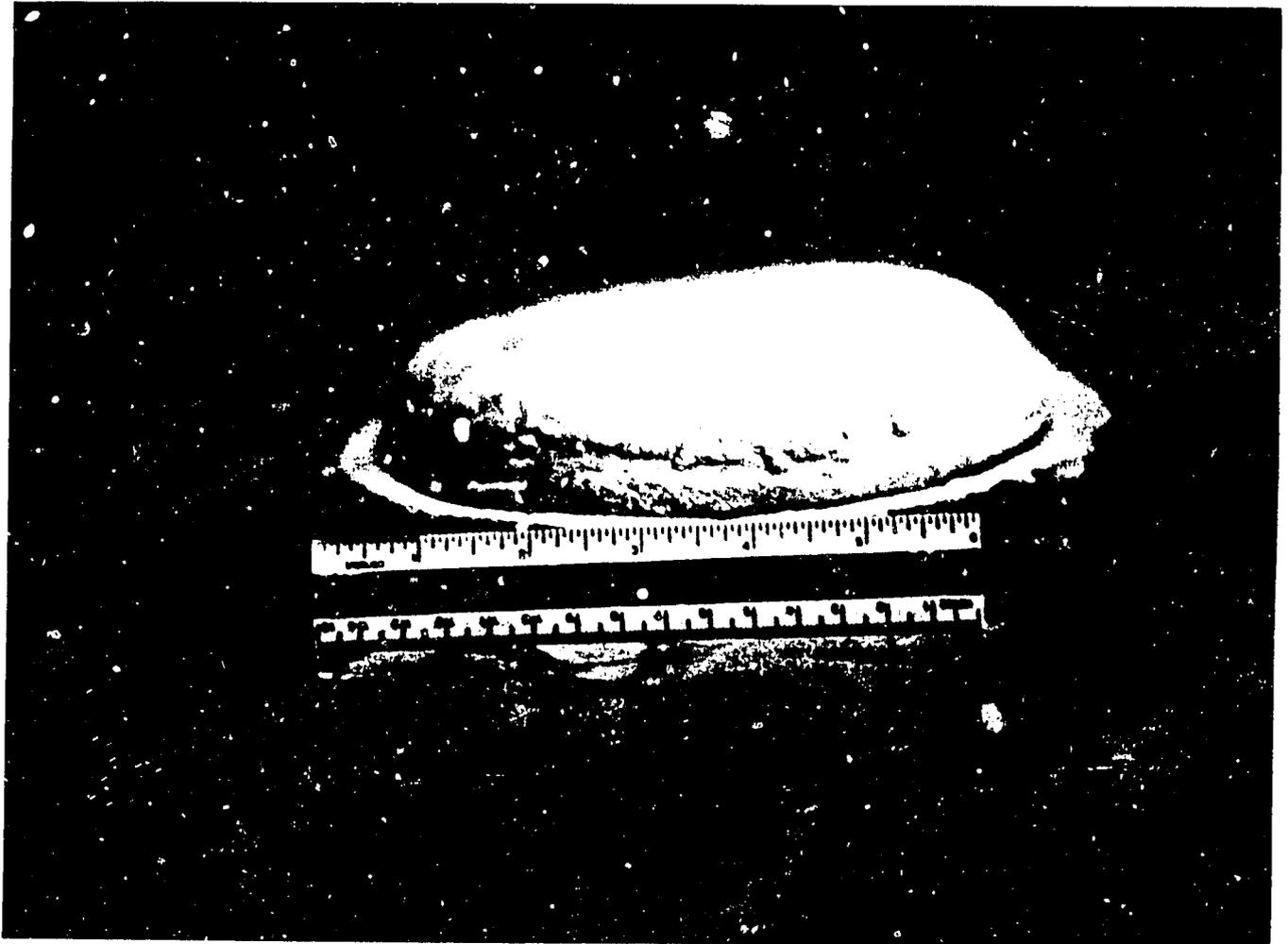
Placing the loaves on banana leaves on makrassas to ferment.  
This was unique to shamsy made in New Valley.



Loaves in the sun to ferment.



The loaf of shamsy with a cut around the circumference.



Placing the bread in the oven.



Bread in the oven baking.



The finished loaf.



Preparing the sourdough.



Wrapping the sourdough.



Placing the sourdough in the basket for storage.



TABLE 1. SUMMARY OF DATA ON SHAMSY BREADS

Ingredients	Beni Suef	New Valley	Assiut	Luxor	Aswan
Wheat Flour (Local 82%)	3 K	10 K	20 K	20 K	14 K
Wheat Flour (Imported 72%)	2 K	5 K	-	-	-
Salt <sup>1</sup>	33 G	150 G	200 G	200 G	140 G
Leavening Agent	Compressed	Sourdough	Sourdough	Sourdough	Sourdough
Water <sup>2</sup>	4.5 L	9.75 L	17.5 L	14 L	9.8 L
Leavening Time in Sun	60 Min	30 Min			
Baking Time	8-10 Min	18-20 Min			
Cost per Loaf	7.9 piasters	8.8 piasters			
Crust Color	Brown spots	Golden Brown	Brown Spots	Golden Brown	Golden Brown
Flavor	Slight Sour	Good Sour	Good Sour	Good Sour	Good Sour
Crumb	Close Cells	Open Cells	Coarse	Coarse	Open Cells
Density	Dense	Light	Light	Light	Light
Weighted Loaf Weight	337 G	305 G			
Loaf Diameter	16 cm	16 Cm			
Unweighted Loaf Weight	201 G				

Salt was weighed in Beni Suef and estimated to be 1% by weight of the flour weight in all other locations.

The amount of water was estimated based on the apparent percent of hydration estimated by comparison to doughs of known hydration.

## MABBATAT and KABBOURI

Tanta -- Kafr Kazel

Mabbat at is a semi-circular loaf of about 39 cm diameter with two thin crusts. The crumb layer is thin and has large open cells. Mabbat at is dried for storage. A smaller, thicker round loaf, kabbouri, is made from the same dough and eaten on the day of baking. It is eaten with honey and may have sugar, egg, or honey added to it before baking. It has a slight sour taste, high moisture, and thick crusts.

### FORMULATION

ITEM	AMOUNT
Corn Flour	2.5 K
Wheat Flour (82 %)	7.5 K
Yeast, compressed	100 G
Salt	100 G
Water	85 %

### TOOLS

ITEM	MATERIAL
Matroha	Plywood Circle
Knife	Sikkina
Roller	Neshiva
Scoop	Wood
Table	Metal--to put fuel in oven
	Wood

### THE OVEN

Location	Outside
Shape	Rectangular
Fuel	Miska
Material	Gella and chopped corn stalks
	Brick coated with clay--straw

### OPERATIONS

The flour was sifted into a large bowl. Water was added and mixed into the flour. Yeast and salt were added and all mixed together. The dough had about 60% moisture. Mixing was done with punching and scrubbing motions. The kneading was done with the dubbing motion. The dough was fermented for 1 hour before dividing.

Large balls of dough of approximately 750 g were scooped out of the bowl of dough. The ball was dipped into flour and shaped into a ball. The matroha--a large circle of plywood--was placed on a low table or tableea and was coated with a thick layer of bran. The ball of dough was placed on the matroha and was flattened by pounding it with the open hands. A layer of bran was sprinkled over the top of the loaf and the circle of dough was further flattened by the roller, by pounding, and by tossing on the matroha. The loaf was turned over by giving a flip with the matroha. The flattened dough formed a 40 cm circle. After dividing, the mabbat at was further fermented for 30 minutes while the oven was heated.

Before baking, the mabbatat was cut into halves. One loaf was baked for 3 minutes and 5 seconds. After baking, the loaves were aerated to cool. For storage the mabbatat was returned to the oven to dry. It was stored in wooden boxes. Kabbouri was made from the same dough but was flattened to a 20 cm circle instead of a 40 cm circle like the mabbatat. Kabbouri was baked about 4 minutes. One baked half-circle loaf weighed 238 g.

This batch cost 3.06 LE and made 50 loaves for a cost of 3.3 piasters for each half-circle loaf or 3.1 piasters per 100 g of bread.

The bakers told of 2 other types of bread. One is made of milk, corn flour, wheat flour, and water. It is not fermented and is eaten on the day of baking. The other is made of mashed boiled sweet potato and flour. It is mixed, baked, and eaten while fresh.

Fatier masheltit is also made from the same dough as the mabbatat and kabbouri. The dough is stretched very thin, butter oil is drizzled over it, and then it is folded over, stretched very thin, and more butter spread over it. The many thin layers of dough coated with butter are placed in a well-buttered pan and baked in a slow oven--with the residual heat left after the flames die down.

Flattening the bread by pounding.



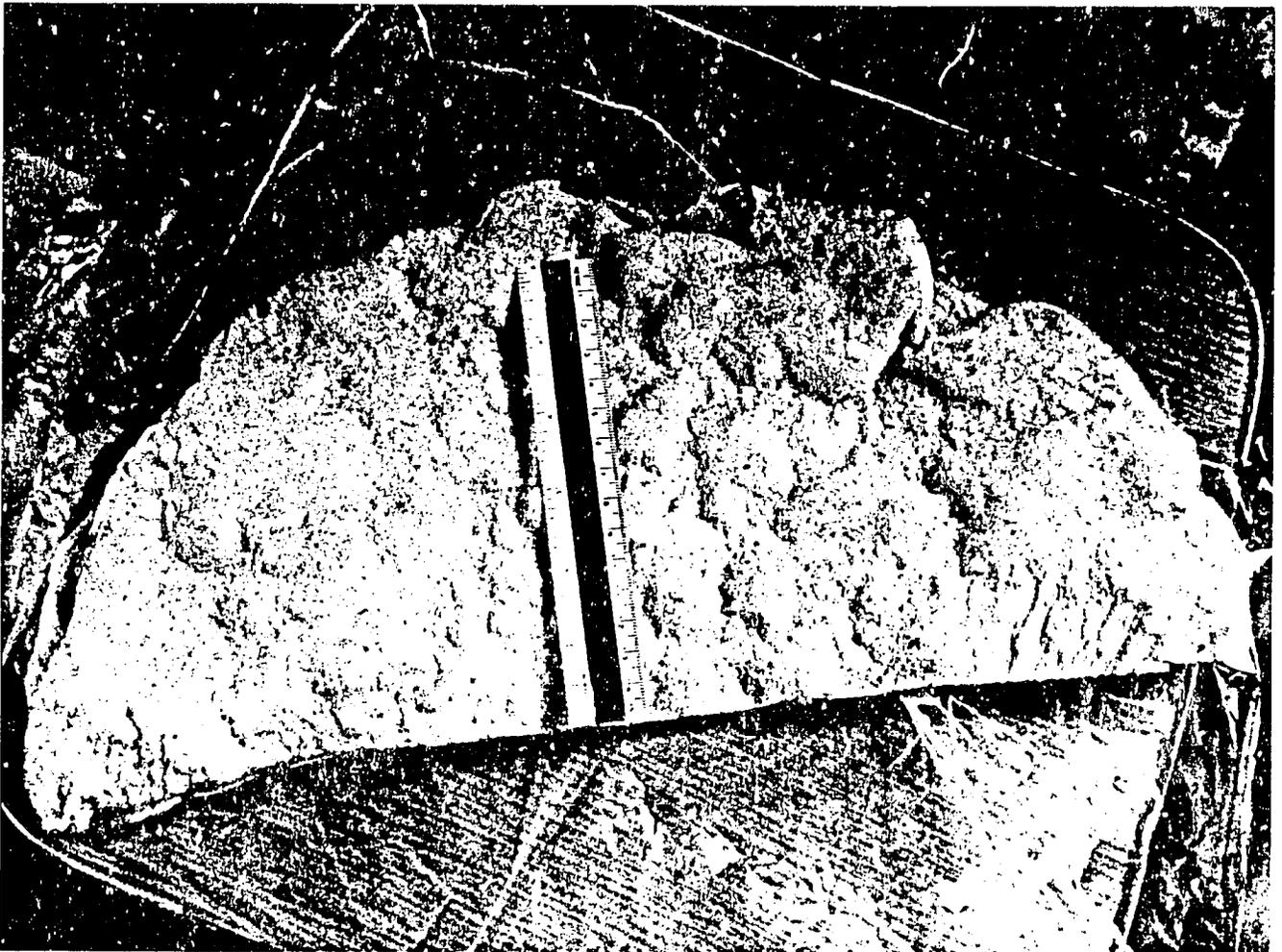
Flattening the bread by rolling.



Turning the bread by flipping it.



The finished Mabattat.



The Mabattat, Kabbouri and Nashif breads.



## Manottot

### Fayoum--Nazlah

Manottot is a large thick-crust bread. It is unique in the manner in which it is baked. The hearth of the oven was covered with a layer of pea gravel. The gravel probably promotes a more even browning on the bottom crust.

### INGREDIENTS

ITEMS	AMOUNT
"Sour Yeast"	
Yeast (Compressed)	30 G
Wheat Flour (72%)	400 G (Imported)
Wheat Flour (82%)	1600 G (Local)
Water	1.5 L
Wheat Flour (72%)	2000 G (Imported)
Wheat Flour (82%)	8000 G (Local)
Salt	80 G
Water (45 degrees C)	11 L

### TOOLS

ITEM	MATERIAL
Bowls	Plastic, Aluminum
Matroha	Palm Wood
Magraffa	Metal
Metal Rod	

### THE OVEN

Material	Brick with clay
Location	In room outside living quarters
Hearth	Clay
Fuel	Cotton Stalks, Gella

### OPERATIONS

The yeast was mixed with flour and water and allowed to stand covered overnight. The next morning the flour was sifted into the mixing bowl. The salt was added to the warm water, then the water was poured into the flour. The dough was mixed by punching the fists into the mixture. The dough was pulled from the edges of the bowl, then folded into the center, and the dough was punched again. The technique is called "malkh l'ageen" or "tavadiir". The starter was then added to the bowl and mixed in by punching. More water was added, followed by more punching.

After sufficient water had been mixed into the dough, the baker wound the dough around her hands. Then the final kneading was done using the dubbing. The mixing-kneading operation took 45 minutes. The final water content was 105%.

The dough was allowed to ferment for 36 minutes. The loaves were divided, dipped into flour, shaped into a ball, and placed on a thick layer of bran on a cloth in a small room. The loaves were covered with a cloth and allowed to ferment for 45 minutes. The total fermentation time, including the initial fermentation,

the final fermentation time and the time for shaping the loaves, was 1 hour and 36 minutes.

The oven was fired up using gella and cotton stems. Three women were involved in the baking operation. One woman carried the loaves from the fermentation area to the oven, a second woman flattened the loaves with the matroha, and the third woman baked the loaves. The first woman carried away the baked loaves and carried in fuel. The loaves were baked 50 seconds. The hearth of the oven was covered with small gravel. This seemed to prevent the formation of brown spots on the bottom crust. The loaf was tossed onto the layer of gravel. When the loaf puffed up like a balloon it was pulled from the oven and placed on a tray to cool. One unbaked loaf weighed 514.5 g. The average weight of three baked loaves was 472.2 g and the average diameter was 31.5 cm. This batch would make 48 loaves at a cost of 9.3 piasters per loaf or 2.0 piasters per 100 g of bread.

Blending the ingredients.



Kneading the dough by punching.



Additional water and punching give a slacker dough.



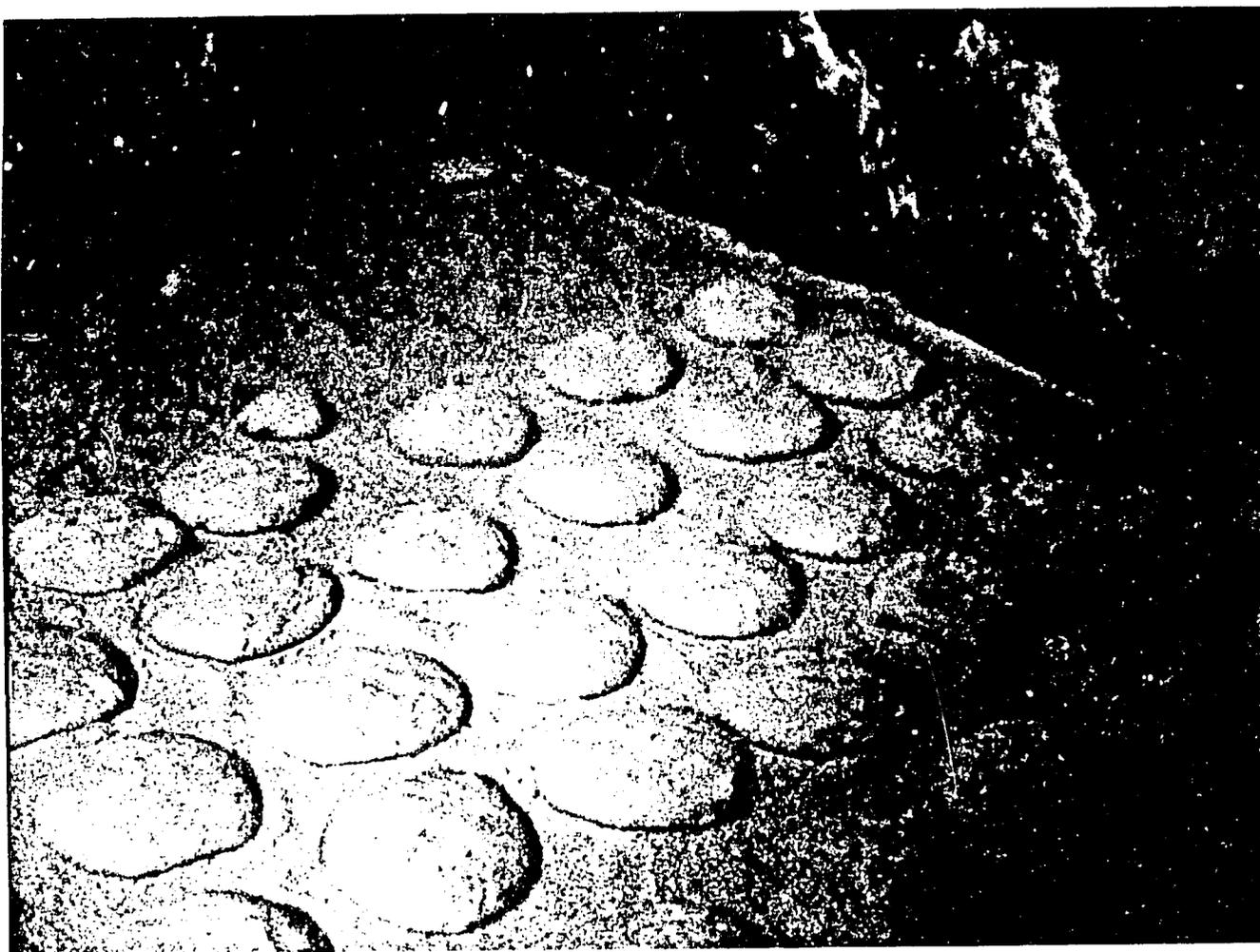
Breaking the bubble formed by dubbing.



Dividing the dough.



Bread in a small room on a bran covered cloth for fermentation.



The baker pokes her fingers into the loaf around its circumference to assure that the resulting flattered loaf will be round.



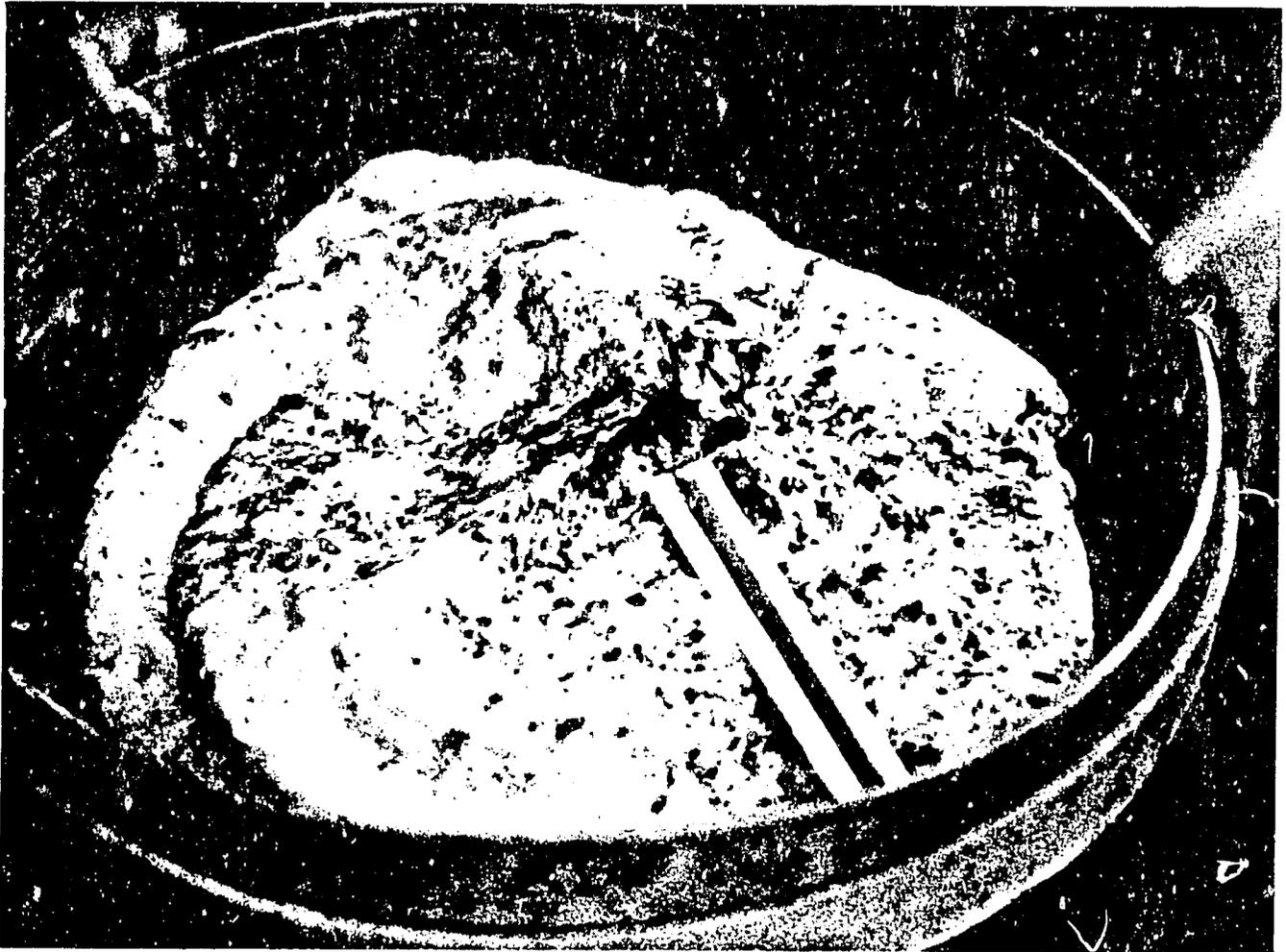
Flattening the loaf on the matroha.



Baking the manottot. Note the layer of gravel on the hearth of the oven.



The finished manottot.



## AMH BREAD or BAKOOSH

### Sentimeh

Amh means wheat. The amh bread contains corn flour as well as wheat flour. It is baked by this family only for special occasions because it requires the use of two ovens and takes a lot of time. This bread is a crisp, dry bread with 2 thin crusts. It is crushed and eaten in milk or soup. It is also sprinkled with water and placed under cloth to freshen and soften it.

### INGREDIENTS

ITEMS	AMOUNT
Corn Flour	7 K
Wheat Flour (32%)	14 K
Sour Starter	750 K
Yeast (Compressed)	50 G
Water	80-85%

### PROCEDURES

The flours were sifted and mixed. The water was added and mixed. The yeast was added and mixed. The dough was kneaded with the dubbing motion. The dough was allowed to ferment about 1 hour, the time depending on the yeast activity. The dough was divided by hand with the addition of water. The dough was scooped out, tossed in the air to form a ball, then dropped onto a flour-coated board and flattened. The loaves were allowed to ferment for 15 minutes. After fermentation, the loaves were scooped up into the hands, tossed on the open hands to flatten, then tossed onto the hot hearth of the oven. The amh bread was baked in the smaller oven with the clay hearth. The baker said it was hotter than the larger oven with the iron hearth. The steam rapidly expands forming a balloon of dough. The loaves were placed in the larger oven to dry them. After baking and before drying, the loaf was flattened in order to facilitate storage. The dry loaf can be stored indefinitely. It is stored by this family in wooden boxes that had been lined with a mixture of ground black pepper and coal. The pepper repels insects.

### COSTS

ITEM	COST IN LE
Woman	3.00
Fuel and oven	1.00
Ingredients and milling	4.25

TOTAL 8.25

This size batch of bread produced about 100 loaves of bread for an estimated cost of 3.7 piasters per loaf or 2.7 piasters per 100 g of bread.

Amh bread in the foreground and mashtuoah in the back.



## SOFT AMH BREAD (TARI) and HARD AMH BREAD (NASHIF)

Dakahliya--Monsoura--el Omaid

The tari amh bread is a soft, balady-type bread. It is eaten fresh and is made only for special occasions. It can be stored for 2-3 days.

### INGREDIENTS

ITEM	AMOUNT
Wheat Flour (82%)	10 K
Corn Flour	8 K
Yeast (Compressed)	100 G
Salt	100 G
Water	80 %

### TOOLS

ITEM	MATERIAL
Bowls	Aluminum, Earthenware
Matroha	Plywood circle
Metal Rod	
Scoop	Metal

### OVEN

Location	Outside
Material	Brick
Shape	Rectangular
Fuel	Stalks of corn, rice, maize
Hearth	Iron

### OPERATIONS

The yeast was dispersed in about 1 L of water. Flour was sifted into the bowl. The water was added. The dough was kneaded for 17 minutes. The first kneading-mixing was done by pulling the dough from the edge of the bowl, punching it down in the center, turning the bowl, and repeating the action. Later kneading was by dubbing.

The dough was fermented for 1 hour. It was divided and shaped into balls. A handful of dough was scooped out of the bowl, dipped into flour, then shaped into a ball. The ball was placed on a matroha and slightly flattened, using the tossing, flipping motions. One unbaked loaf was estimated to weigh 400g, and one baked loaf of tari weighed 240 g. A batch would make 45 loaves at a cost of 7.8 piasters per loaf or 3.2 per 100 g.

Bread for storage, called nashif bread, is made from the same dough. More corn flour and water were added to the dough. This dough was also shaped and flattened on the matroha. It was cut into two pieces and baked. This nashif bread puffs up and forms 2 hard crusts. It was returned to the oven for drying before storage. A batch would make 142 half-circle loaves that weigh 70 g at a cost of 2.5 piasters per loaf or 3.6 per 100 g.

Kneading the slack dough



Kneading the dough



Kneading the dough



Dividing and Shaping the dough



Dividing and shaping the dough



Flattening the loaf by pounding



Flattening the loaf by rolling



Cutting the loaf with the knife or sikkina



Baking the loaf



The finished nashif bread



## NASHIF BREAD

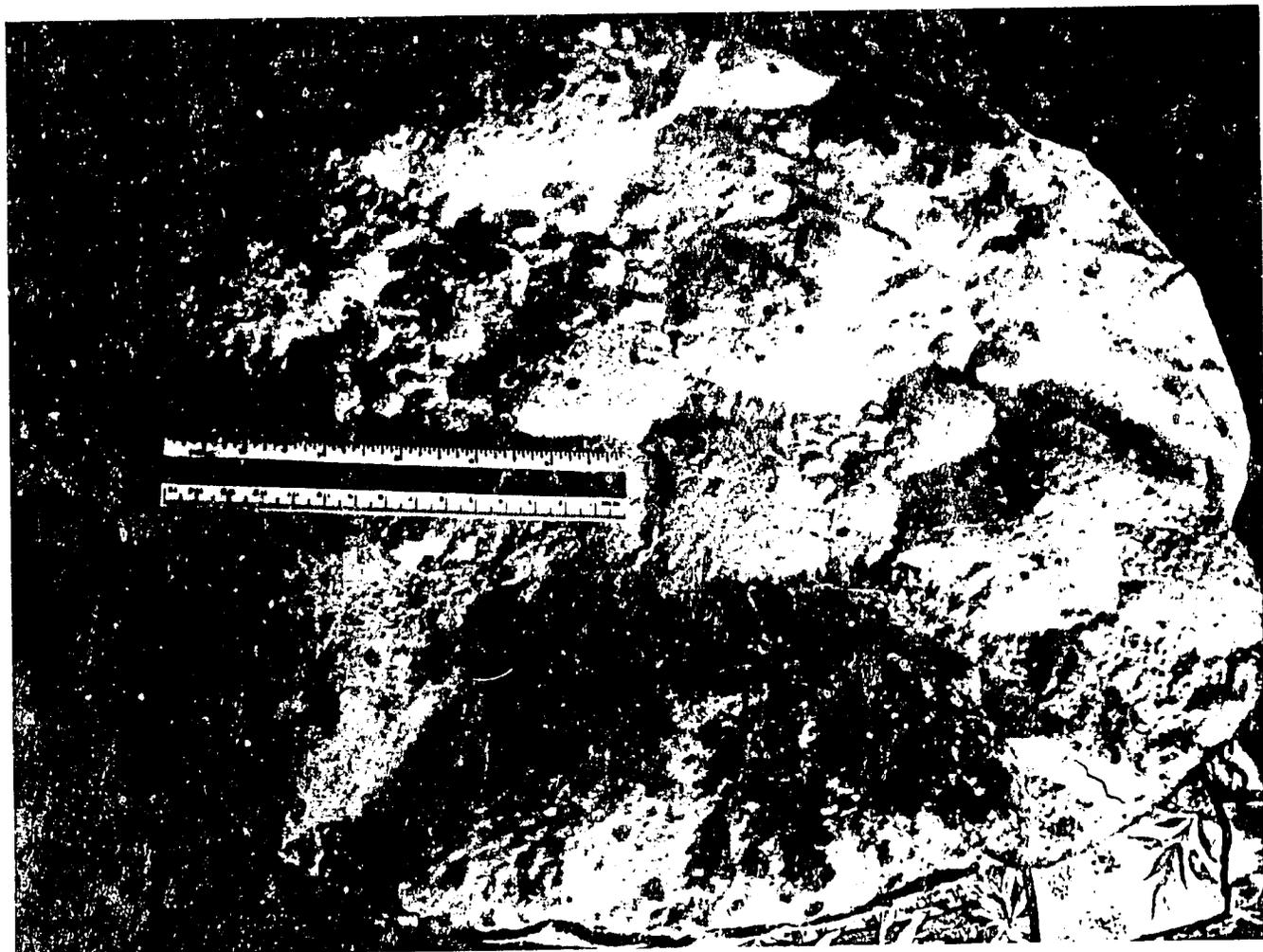
### Nubaria Station

The woman at Nubaria station was nearly finished with the bread when I arrived. She said that she used a flour mixture that contained 20% maize flour and 80% wheat flour. She added yeast, salt, and water. The ingredients were first mixed by punching, then the bread was kneaded by dubbing. The bread was allowed to ferment for 1 hour before being shaped into laaves, and another hour after being shaped and before being baked. The bread is flattened by pounding. After baking the bread is returned to the oven to dry so that it keeps well without spoiling.

Mixing the dough by punching.



The finished nashif bread.



## TOURIST BREAD

### Casino el Dar, Cairo

The Casino el Dar is an open air restaurant. It caters to the tourist trade. Bread is made four or five times through the day so that it can be served fresh to the customers. These loaves are smaller in diameter and have a smaller weight than the bread from the government bakeries. Each loaf weighs 71 g compared to the 169-g weight of commercial balady bread. The loaves have two crusts with a thin layer of moist, coarse crumb.

### INGREDIENTS

ITEM	AMOUNT
Wheat Flour (72% extraction)	10 K
Salt	150 G
Yeast (Compressed)	100 G (from Alexandria)
Water	110 %

### OVEN

Location	Outside
Material	Red bricks and clay
Shape	Rectangular
Hearth	Clay
Fuel	Wood

### OPERATIONS

The flour was sifted into a large aluminum stock pot. Water was added to the level of about 110 %. The salt and yeast were mixed in. Mixing and kneading were done by hand. After kneading, the dough was allowed to ferment for one hour, the exact time of fermentation depending on the yeast activity. The fluid dough was divided and shaped by hand. A small handful of dough was scooped out, dipped in flour, then tossed from the right hand to the left hand and back. It was then dropped onto a thick layer of bran on a wooden tray. About 30 to 36 loaves were placed on each tray. The trays have deep sides, and when stacked on each other, form a fermentation cabinet. The loaves were fermented for 30 minutes. The fermented loaves were picked up in the baker's hands, tossed on her open hands a few times, then were tossed onto a floured matroha. The loaves were flattened further using the matroha. The matroha was used to toss the loaves onto the hot hearth. The loaves were baked for 2 minutes and 10 seconds--until they were puffed up and nicely browned. The cooked loaves were pulled from the oven using the metal rod and placed in a basket to cool.

### COSTS

ITEM	COST IN LE
Woman	1.00 per batch
Fuel and Oven	0.50 per batch
Ingredients and Milling	4.05 per batch
TOTAL	5.55 per batch

This batch made 200 loaves for an approximate cost of 2.5 piasters per 71-gram loaf or 3.5 piasters per 100 g.

The baker and her helper. Notice the pile of wood that is used for fuel here.



The oven.



The bread is placed on a thick layer of bran in trays. The trays are stacked to form a fermentation cabinet.



The fermented loaf is placed on a matroha.



The fermented loaf is flattened on a matroha before baking.



The bread is moved around in the oven using a long metal rod.



The finished loaf of bread.



## FELLAHI or BALADY BREAD and HANUUN or soft bread

### Rasheed--Edfina

Fellahi or balady bread was the common people's bread in the Rasheed area. It was formerly made with 1/3 wheat flour, 1/3 maize flour, and 1/3 rice flour. When the price of rice became too great, the formulation was changed to 2/3 wheat flour and 1/3 maize flour. Today, the formulation is 100 % wheat flour.

### INGREDIENTS

ITEM	ORIGINAL	CURRENT
Wheat Flour (82%)	4 K	12 K
Corn Flour	4 K	-
Rice Flour	4 K	-
Warm Water	60%	60 %
Starter		
Yeast (Compressed)	15 G	15 G
Wheat Flour	1 K	1 K
Warm Water	600 ML	600 ML

### TOOLS

ITEM	ARABIC	MATERIAL
Sieves	Manchol	Wood frame with silk or plastic
Bowls	Maggour	Aluminum
Matroha	Matroha	Plywood
Table	Tableea	Wood
Roller	Neshiva	Wood or Plastic
Knife	Sikkina	metal

### OVEN

Location	Inside
Material	Clay with some bricks
Fuel	Rice Straw
Hearth	Iron

### OPERATIONS

The night before baking, the sourdough was started. The compressed yeast was dispersed in warm water. The flour was sifted into the bowl and mixed. The bowl was covered and left to ferment overnight. The next morning, the rest of the flour was sifted into a large bowl and water and salt added. The sourdough was added and all mixed together with the punching, folding motion.

Kneading was done with the "dubbing" as seen in other breads. The kneaded dough was covered with a cloth and left to ferment for 2 hours in the winter or 1 hour in the summer. The baker said she tells if the bread has fermented for enough time by the sound it makes when she pats it.

The matroha was covered with a thick layer of the fine bran that was reserved from sieving the flour. A handful of dough was scooped out of the bowl, dipped in flour, shaped into a sphere, and dropped onto the bran layer. The balls of dough were then

removed to another matroha, one at a time, and were flattened by means of the roller. The flattened loaves were cut into 2 pieces before they were put into the oven to bake. The loaves were baked for 20 to 30 seconds. One unbaked loaf weighed 195 g, a loaf being a full circle. One whole baked loaf weighed 158 g, 1/2 loaf weighed 73.6 g.

The full loaf was about 40 cm in diameter. When the dough was flattened to about 20 cm in diameter, the resulting bread was soft. The soft bread is called hanuun and it is eaten fresh. The hanuun may be partially baked and removed from the oven in order to make a small depression in the top of the loaf. The depression can be filled with an egg, some jelly, or honey. The loaf is returned to the oven and the baking completed. One loaf of baked hanuun weighed 160 g.

This batch of bread made approximately 98 full loaves at a cost of 4.2 piasters per loaf or 2.8 piasters per 100 g of bread.

Sifting the flour.



Adding the yeast.



Dividing the fellahi.



Unbaked fellahi fermenting before baking.



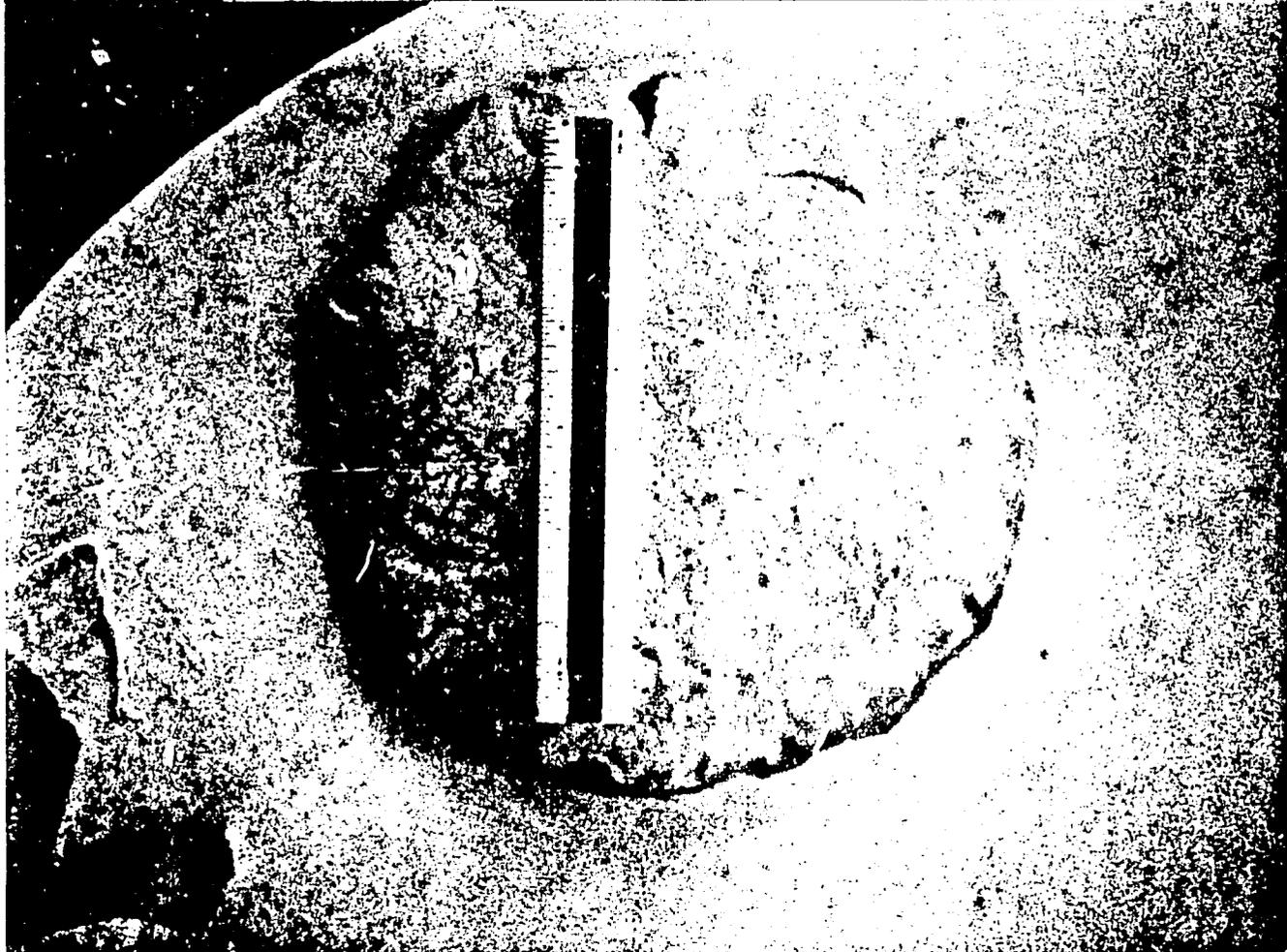
Flattening the fellahi with a roller.



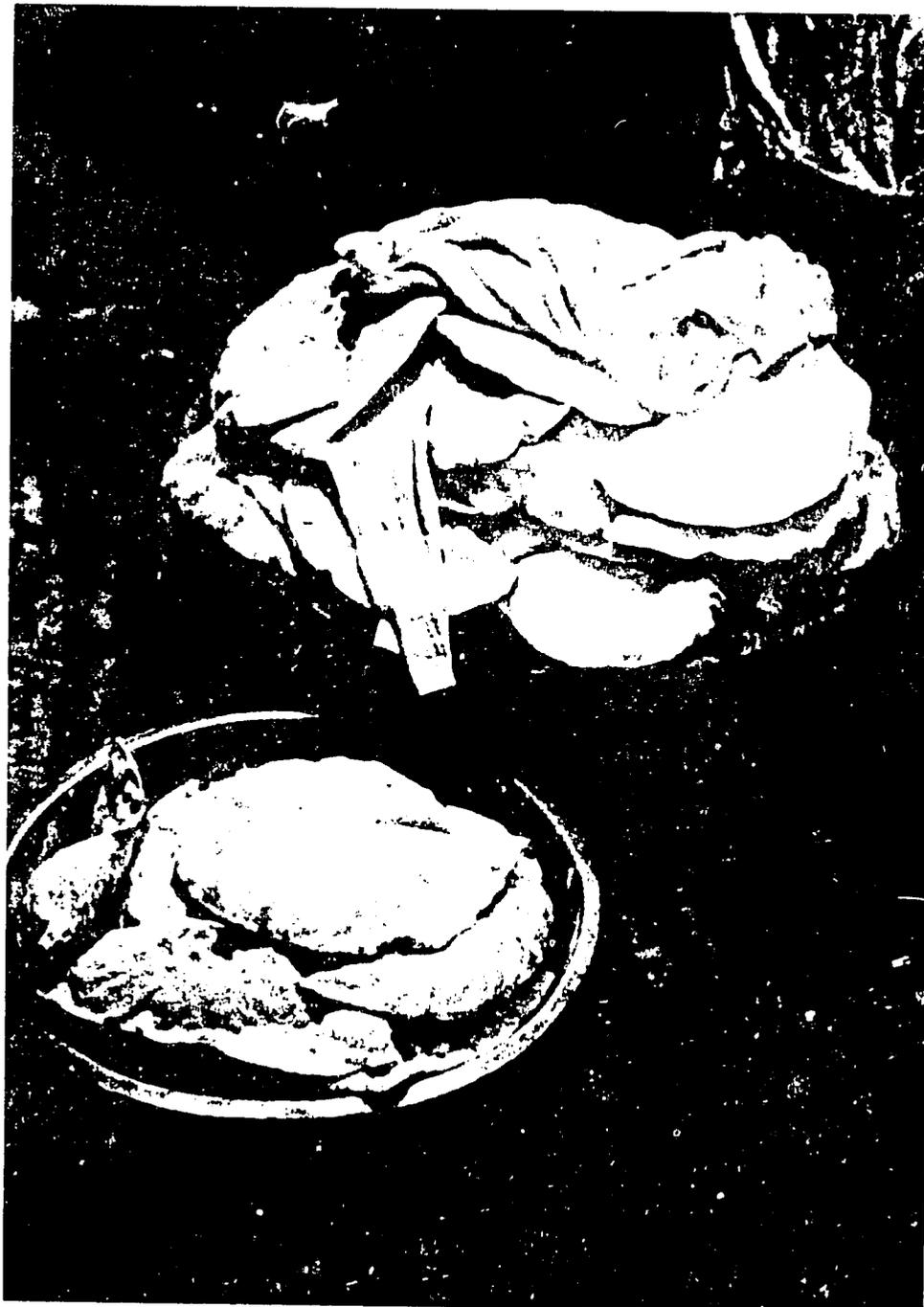
Flattening the hanuun by pounding.



Baked fellahi and baked hanuun.



Fellahi in storage.



Flouring the tableea for making fatier mashelit.



Dividing the dough for fatier masheltit.



Starting to stretch the dough for fatier masheltit.



The dough stretched thin.



Spreading melted butter over the dough for fatier mashelit.



Placing the fatier masheltit in a pan for baking.



Baking the fatier masheltit.



The baked fatier.



## BAKUUN BREAD

Burg al Arab--A Bedouin bread

Bakuun is a pocket bread with thicker, meatier crusts than other pocket breads and is similar to hanuun.

### INGREDIENTS

ITEM	AMOUNT
Wheat Flour (Local 82%)	4 K
Yeast (Sourdough)	
Water, boiled and cooled until just warm,	90 %

### OPERATIONS

The yeast or chamiira was prepared the night before baking. Commercial compressed yeast from the store was mixed with water and flour and was allowed to ferment overnight. The next morning flour and water were added to form a slightly slack dough. The dough was covered with cloth and set in the sun to ferment. After one to two hours, depending on the temperature, when the dough had risen enough, it was divided into balls. Each ball was flattened using a roller. The flattened loaf was placed in the oven to bake. This bread is eaten when fresh, and is prepared every 3-4 days. This batch made 33 loaves at a cost of 3.7 piasters per loaf or 2.1 piasters per 100 g of bread.

Sifting the flour.



Adding the water.



Mixing the dough.



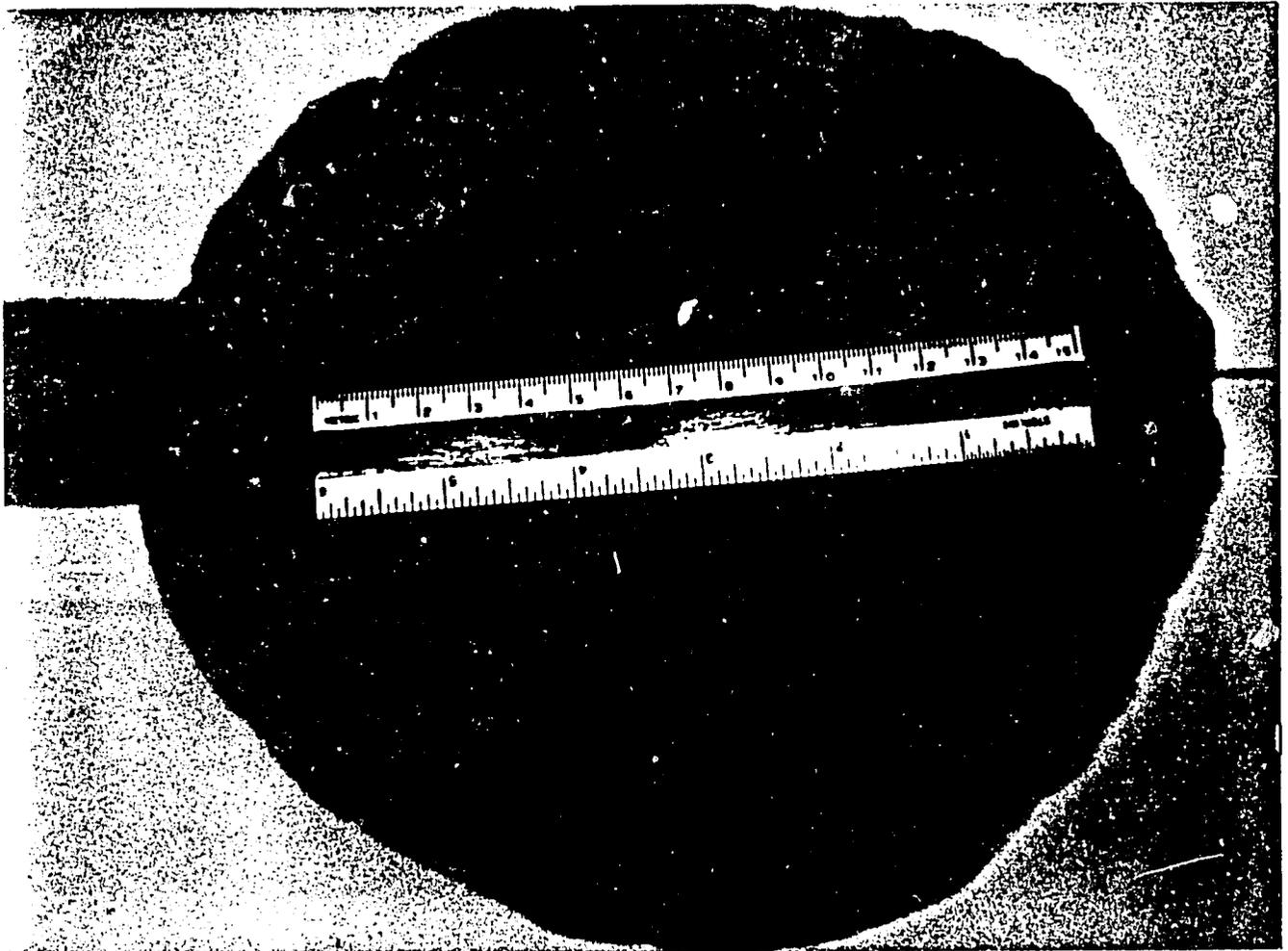
Kneading the bread.



The bread fermenting in the sun.



The finished loaf.



## FAISH BREAD or ZALOUT

Faish or zalout is a breakfast bread. According to folk tales, it is carried by travelers from upper Egypt and it provides adequate nutrition to them during their travels.

### INGREDIENTS

ITEM	AMOUNT
Sour Yeast	
Yeast (Compressed)	50 G
Wheat Flour (Local 82%)	1 K
Milk	1 L
Water	1 L
Flour	9 K
Sugar	1.5 K
Cow's Butter	1 K
Water	60 %

### OPERATIONS

The sour yeast was started the night before baking. The yeast from the last baking was mixed with water, flour, and milk and was allowed to ferment overnight. In the morning melted butter, flour and water were added and mixed into the dough. The dough had a fairly low moisture content--55-60%. Melted butter was spread over the baking pans to prevent the sticking of the bread during baking. Butter was spread on the hands and poured on the dough during cutting and shaping. The bread was shaped into elongated ovals and was placed on a baking sheet, or it was made into a sheet which covered the whole baking pan. The bread was allowed to ferment for about 1 hour before baking. It was placed in the oven, still on the baking sheets. It is baked at a low temperature for about 20 minutes.

This bread is very nutritious with good quality and quantity of protein from the milk and with high caloric content from the butter and sugar. It is quite suitable for starting a day of hard labor. Bakers in Aswan also said that more or less butter could be used, and that more or less milk could be used, and that eggs are sometimes used in the dough. This batch makes about 160 pieces at a cost of 6.6 each or 9.0 piasters per 100 g.

Dividing and shaping the loaves.



Faish in the pan ready to go into the oven.



Finished faish in storage.



## ORUS

### Monsoura--El Omaid

Orus bread is a breakfast bread made for special occasions. The people in El Omaid prefer the milk and butter from the water buffalo because it has a higher butterfat content and because it is whiter than cow's milk. The milk, sesame seeds, dates and butterfat contribute an improved amino acid balance, increased protein content, and higher caloric content than would be found in bread made with wheat flour, yeast, salt and water.

### INGREDIENTS

ITEM	AMOUNT	COST
Milk, fresh	1 L	0.75 LE
Wheat Flour (82%)	4 K	0.50 LE
Butter, melted	1 K	6.00 LE
Sesame Seeds	300 G	0.75 LE
Banana Oil	1 vial	0.10 LE
Filling		
Dates	1 K	0.50 LE
Sesame Seeds	200 G	0.50 LE
Banana Oil	1 vial	0.10 LE

### TOOLS

ITEM	ARABIC	MATERIAL
Sieve	Manchol	Wood, Plastic, Silk
Mixing Bowl	Maggour	Aluminum
Matroha	Matroha	Plywood circle
Table	Tableea	Wood

### OVEN

Location	Outside
Material	Brick with Clay
Shape	Rectangular
Fuel	Stalks of corn, rice, cotton
Hearth	Iron
Hearth opening	Very wide

### OPERATIONS

The milk was poured into the mixing bowl. The yeast was added and dispersed by mixing it with the hands. The flour was sifted into the milk and mixed in. The melted butter was poured into the mixture and flour added until a very stiff dough was formed. Sesame seeds and one vial of banana oil were added and mixed into the dough.

A low table called a tableea was placed on the balcony. The women used it to hold the dough while it was flattened into 4" circles. The flattening was done with the fingers. A small handful of filling was scooped up with the fingers and placed in the center of the circle of dough--about 20 G of filling. The dough was folded over the filling and sealed. The small loaf was again flattened into a 4" inch circle and set aside to raise.

Usually this bread is prepared in the afternoon and allowed to rise overnight and is baked early in the morning. One unbaked loaf weighed about 80 g. The fermented loaves were placed on a baking pan and placed in the oven. The bread was baked for about 15 minutes, the time depending on the temperature of the oven. The bread is eaten fresh and can be stored for 3 to 4 days. This batch produced 76 loaves at a cost of 11.7 piasters per loaf or 16.3 per 100 g.

Sifting the flour.



Mixing the dough.



Mixing the filling.



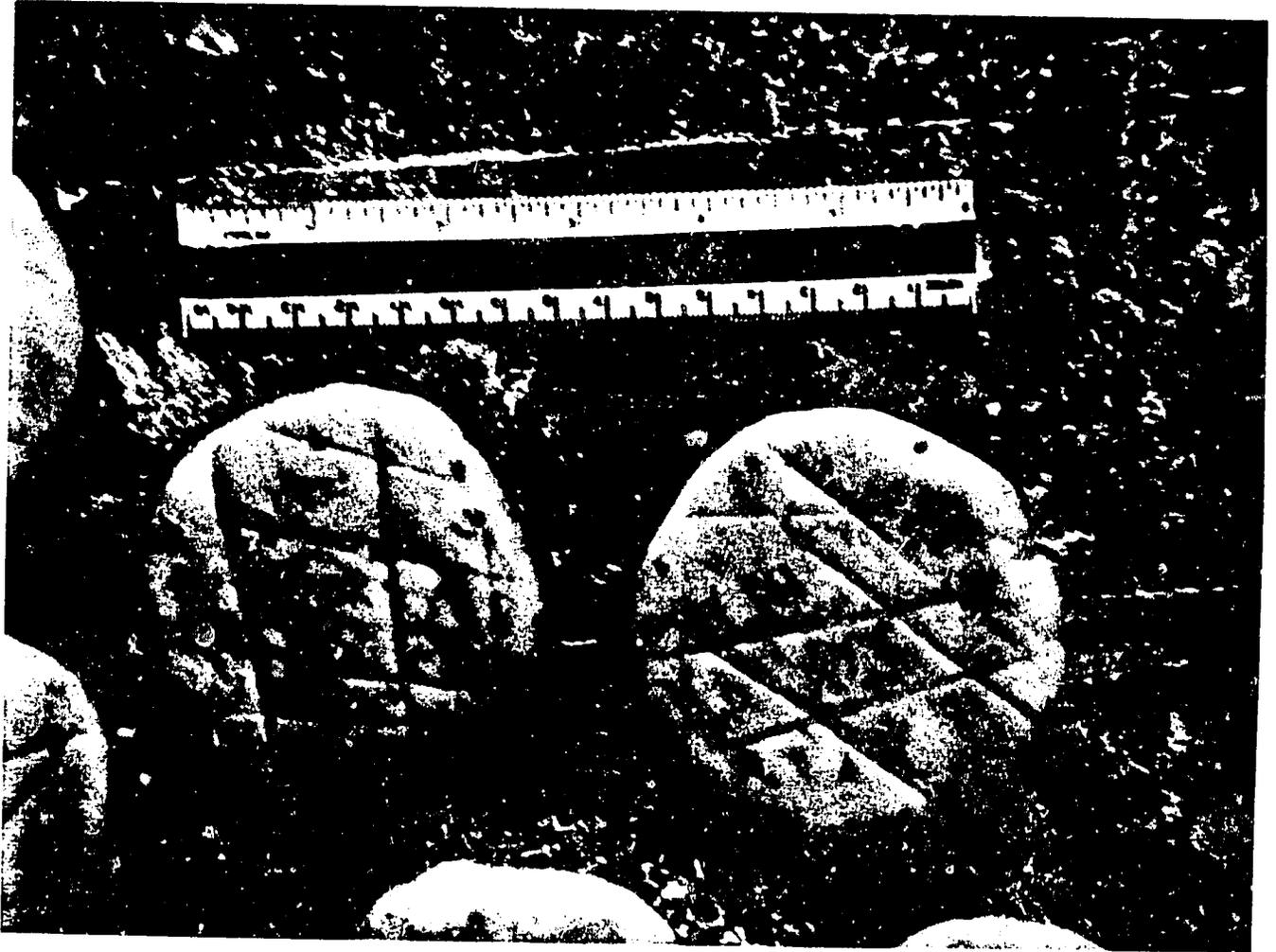
Shaping the loaf.



Adding the filling.



Unbaked 'orus.



Putting the bread in a pan for baking.



'Orus in the oven baking. Note the pan in front of the hearth opening.



Removing the baked 'orus from the pan.



## ARA IISH

### RASHEED--Edfina

Ara Iish is a breakfast bread containing flour, sour milk, butter, sesame seeds and yeast. It has some similarity to orus made in el Omaid.

### INGREDIENTS

ITEM	AMOUNT	COST
Sour milk, Cow	2 L	1.50 LE
Yeast (Compressed)	15 G	0.10 LE
Butter, Cow's	1 K	6.00 LE
Flour (Local 72%)	12 K	1.50 LE
Sesame Seeds	100 G	0.25 LE
Total		9.35 LE

### TOOLS

ITEM	ARABIC	MATERIAL
Sieve	Manchol	Wood, silk, plastic
Mixing Bowl	Maggour	Aluminum
Table	Tableea	Wood
Matroha	Matroha	Wood
Knife	Sikkina	Metal
Roller	Neshiva	Wood, Plastic Pipe

### OVEN

Location	Inside
Material	Clay with some brick
Hearth	Iron
Hearth opening	Narrow

### OPERATIONS

The flour was sifted through a fine silk mesh sieve. The fine bran was reserved for use in the balady or falahi bread. The sifted flour was added to 2 liters of sour cow's milk. The milk and flour were mixed together. The yeast was crumbled into the milk and flour mixture. Melted butter was added and all were mixed together. More flour was added to make a stiff dough. The dough was kneaded by punching and folding.

The mixed dough was formed into small, medium or large size circles of 111 G, 156 G, and 318 G, respectively. The medium size circles were cut into 2 pieces and the large circles were cut into four pieces. The quarter circle is the preferred shape. The loaves were flattened by means of small wooden or plastic rollers called "neshiva".

The shaped loaves were placed under several layers of cloth to ferment. The fermentation time is very long, especially in the winter and would usually be overnight. The low moisture content of the dough probably slows the ability of the organisms to ferment the carbohydrates. The bread for this baking was placed between the sheets on someone's bed and was covered with the sheet, a blanket, and a bedspread.

After a fermentation period of 3 or more hours, the loaves

were carried to the oven area on the wooden matroha. The hearth was cleaned using a soapy rag on a wooden stick. As many pieces of bread as possible were placed on the hearth. The baker kept careful watch to avoid burning the bread. It was baked until it puffed into a balloon shape. It was then removed from the oven and placed on a tray to cool. The baked loaves were placed in a basket for storage. Each loaf was baked from 3 minutes to 3 minutes and 45 seconds. A batch made with 12 K of flour makes about 135 pieces of the 110 g size. This is enough to last this family 4 days.

There are no women to hire as helpers on baking day. A value of 3 LE is considered for the women's time for the baking. It takes about 1 LE's worth of fuel to bake this much bread, giving a cost of about 10.6 piasters per loaf or 12.2 piasters per 100 g. The baked ara iish weighed 87 G, 60 G, and 53 G for the small whole loaf, 1/2 of the medium loaf, and 1/4 of the large loaf, respectively.

The dough.



Dividing the dough.



Flattening the dough.



Cutting the loaves of 'ara 'iish.



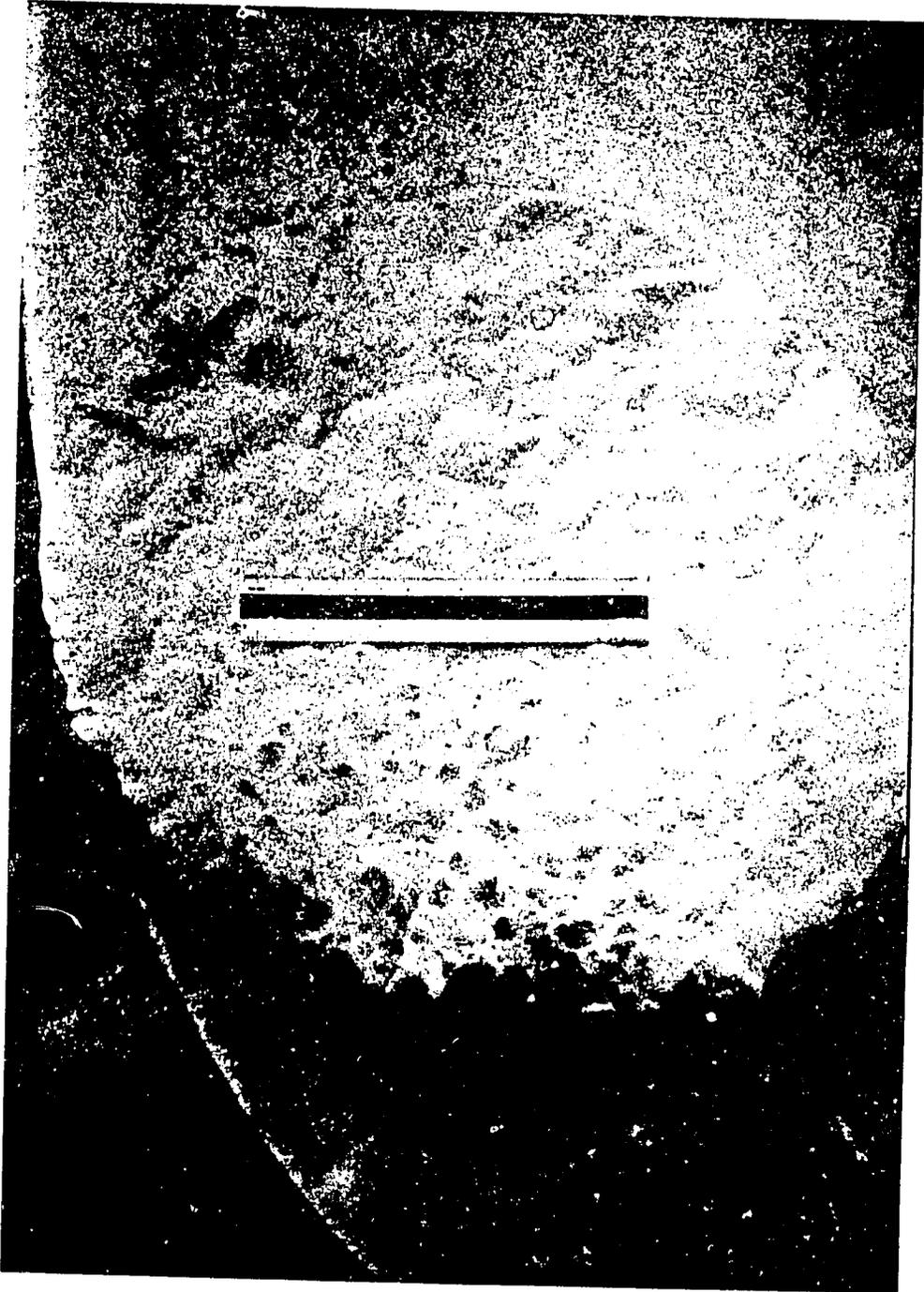
Unbaked 'ara 'iish in bed fermenting.



Baking the 'ara 'iish.



Baked circular-shaped 'ara 'iish.



## BATTAW BREAD

### Beni Suef

Battaw bread is a thin, crisp bread with a loaf diameter of about 50 cm. Battaw bread is eaten during the winter months because that is when the maize flour is available. If dry maize is stored for long periods of time it becomes rancid. A little water is sprinkled on the battaw bread and it is covered with a cloth in order to freshen it before eating. Since it is a dry bread, it can be stored indefinitely, if protected from insects and rodents. The women told us that the men who ate battaw bread were stronger and had more stamina than those who ate balady bread.

After the mixing, three women were needed for the baking of battaw bread. One woman divided the dough, one shaped it, and one baked it.

### INGREDIENTS

ITEM	AMOUNT
Maize Flour	0.97 KG
Fenugreek Flour	0.032 KG
Wheat Flour (82 % local)	3 KG
Salt	60 GM
Water	50-60 %

### TOOLS

ITEM	ARABIC	MATERIAL
Sieve	Manchol	Wood, Silk, Plastic
Mixing Bowl	Maggour	Earthenware
Paddle	Matroha	Palm Wood
Tray	Halla	Galvanized Metal
Water Bucket		Plastic

### OVEN

Location	Inside
Material	Clay mixed with horsehair
Hearth	Clay
Hearth Opening	Wide
Fuel	Cornstalks

### OPERATIONS

The corn was roasted before it was milled. The corn and fenugreek were milled together on a commercial stone mill. There was 3% fenugreek in the corn flour. The flours were sifted into a large bowl and mixed by hand. Water was added and mixed in. The mixture appeared to be 55-60 % water. The dough was kneaded by hand. The dough was not fermented and did not contain yeast. It was divided, shaped, and baked immediately after mixing.

At the time of dividing and shaping, more water was added to the dough, and water was added continuously during the dividing operation. The water was added to make it easier to cut and divide the dough. The woman doing the shaping poured water into a spot near the edge of the bowl. She mixed the water into a small amount of dough, making a slurry of about 70 % moisture. A

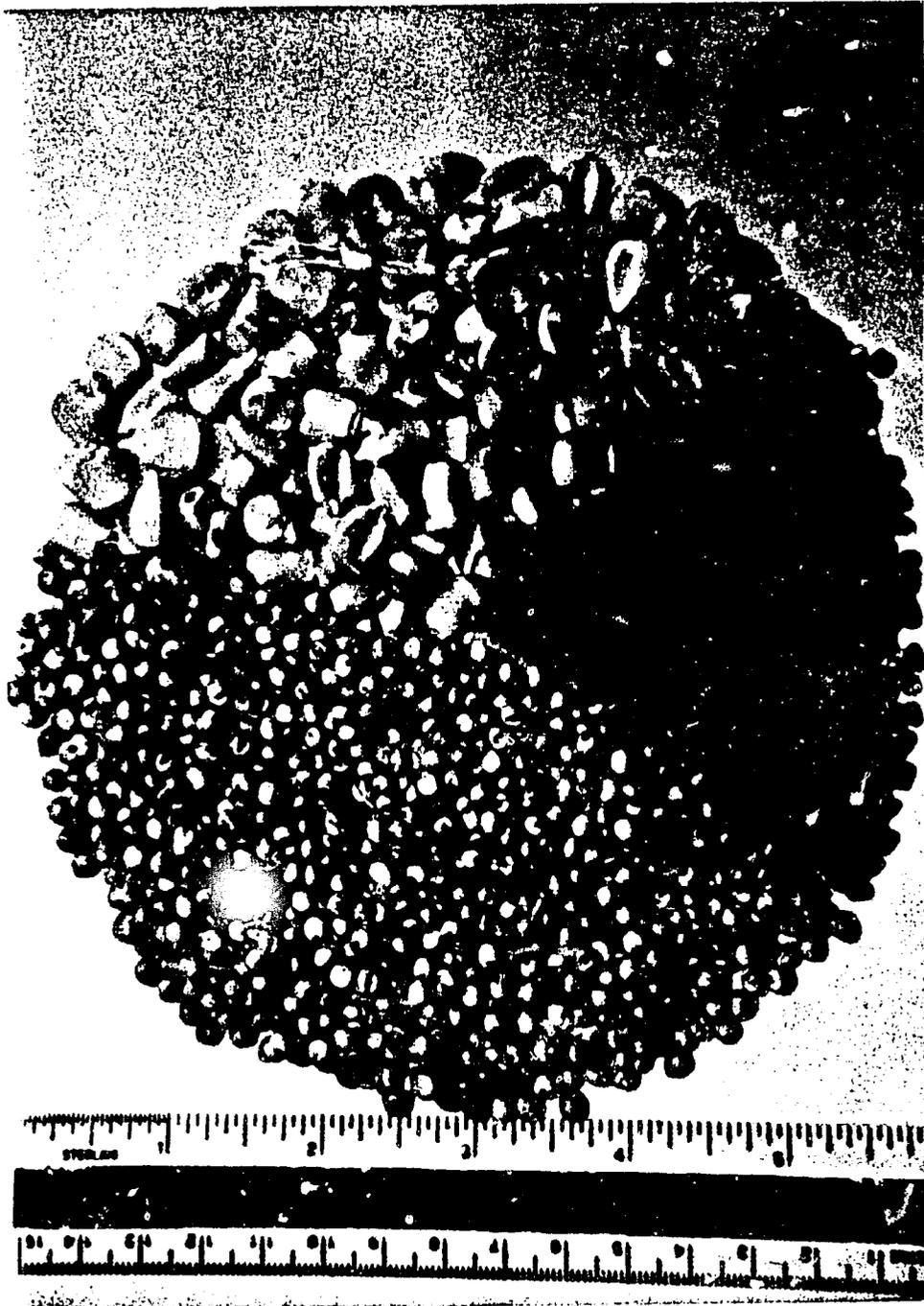
handful of the dough was scooped out of the bowl, tossed in one hand for several times, then dropped onto a floured matroha. The second woman took the matroha and using a tossing, spinning motion caused the dough to spread out into a thin circle. She tossed the loaf onto a larger matroha which the baker used to finish shaping the loaf and to toss it onto the hot hearth of the oven. The loaf was baked for 2 minutes. It was pulled to the front of the oven and turned over with the metal rod. It was allowed to bake for an additional 30 seconds. The baked loaf of bread was pulled from the oven and placed on a burlap bag on the floor to cool. The finished loaf was a thin flat circle with an average diameter of 51.6 cm. The average weight of a baked loaf was 211.2 g, while one unbaked loaf weighed 320 g.

#### COSTS

ITEM	COST
Woman	0.85 LE
Fuel & Oven	0.15 LE
Ingredients & Milling	1.21 LE
Total Costs	2.21 LE

This batch made about 20 loaves, giving an approximate cost of 8.1 piasters per loaf or 3.8 piasters per 100 g.

Maize, fenugreek and sorghum that can be used in battaw bread.



Preparing the oven.



The woman in the foreground is dividing the dough in the next five photos.



Dividing the dough.



Dividing the dough.



The dough is being flattened using the large matroha.



Dough being dropped on the matroha.



The woman at the oven uses her head when she needs another hand.



The finished loaf of battaw bread.



## BATTAW BREAD

El Minya--Al Borgaya

This was a family with 15 children. Bread is baked every 5 to 10 days. The woman uses 22 K of flour for a batch. The maize flour contains 2% fenugreek. A man can eat 3 to 4 loaves at one meal. The bread is eaten with salad, pickles, onion, arish cheese, and cooked vegetables.

### INGREDIENTS

ITEM	AMOUNT
Maize Flour	19.6 K
Fenugreek	0.4 K
Wheat Flour	2 K
Salt	200 G
Water	60 %

### TOOLS

ITEM	ARABIC	MATERIAL
Bowl	Maggour	Earthenware
Paddle	Matroha	Palm Wood
Tray	Halla	Copper
Wooden Stick		
Woven Mat		

### OVEN

Location	Inside
Material	Brick and Clay
Hearth	Clay
Hearth Opening	Very Wide
Fuel	Chopped rice, cotton, and maize stems

### OPERATIONS

The maize and fenugreek were roasted before being milled together at the local stone mill. The flours were sifted into a large bowl. The salt and water were mixed, then poured into the flour. The dough was mixed by hand. The dough was divided by hand, flattened on the matroha, and baked in the oven. One loaf was baked for 1 minute and 23 seconds. This batch made 120 loaves at a cost of 7.5 piasters per loaf or 4.4 piasters per 100 g. Unbaked loaves weighed 263 and 290 g while two baked loaves weighed 174 and 166 g.

Oven for Battaw bread.



Putting the bread into the oven.



Taking the bread from the oven.



Half-a-day's work for this family with 15 daughters.



## BATTAW BREAD

el Minya--Magousa

The bakers in Magousa were members of a farmer's cooperative. They bake once every 3-5 weeks. They bake one day at one home, another day at another home, each helping the other members of the cooperative. Each baking day is a 10 hour day of baking.

### INGREDIENTS

ITEM	AMOUNT
Maize Flour	19.7 K
Fenugreek	300 G
Wheat Flour (72% local )	1600 G
Salt	150 G
Water	60 %

### TOOLS

ITEM	ARABIC	MATERIAL
Bowl	Maggour	Earthenware
Tray	Halla	Copper, Galvanized
Shovel		Metal
Wooden Stick		

### OVEN

Location	On the roof
Material	Brick and Clay
Hearth	Clay
Hearth Opening	Wide
Fuel	Gella, chopped corn, maize, cotton straw

### OPERATIONS

Water was poured into the bowl. The salt was added to the water. The flour was sifted into the bowl. The dough was mixed by hand for 1.5 minutes. The dough was carried upstairs to the oven. One woman divided the dough and dropped it onto a small matroha. The second woman flattened the loaf on a small matroha. The third woman flattened the loaf using a large matroha and placed the loaf in the oven. The loaf was baked for 1.5 minutes. It was removed from the oven and was placed on a mat to cool. When the loaf was cool it was placed on a stack of bread for storage. During the baking, the baker kept moving a wooden stick back and forth under the loaf. Unbaked loaves weighed 276 and 290g while baked loaves weighed 182 and 177 g. This batch made 110 loaves of bread at a cost of 7.9 piasters per loaf or 4.4 piasters per 100g.

Mixing the dough.



Dividing the dough.



Flattening the loaf.



Baking the bread.



## BATTAW BREAD

### ASSIUT--Durunka

The baking of battaw bread was observed in Beni Suef, el Minya, and Assiut. From the ingredients it is apparent that battaw in Assiut is not the same as battaw in the other locations. Generally, battaw contains fenugreek. The fenugreek is added as a percentage of the maize flour. In Beni Suef it was 3 %, in Minea 1.5 % and 2 %. In Assiut there was no fenugreek. Battaw in Assiut contained yeast and was fermented. There was no yeast or fermentation in Beni Suef or Minya.

The fenugreek containing battaw is a thin, crisp loaf of approximately 50 cm in diameter. It is prepared by sifting the flour into a large bowl, adding the water and salt and mixing. The mixing is achieved by two motions. One is a circular scrubbing motion that the bakers said made a homogeneous mixture. The other motion was to pull the dough from the sides of the bowl and punch it down in the center. The final dough moisture of the fenugreek containing battaw was 65 to 70 %. In Beni Suef, additional water was added during the cutting of the dough. The baker said that the water made it easier to cut the dough.

Three or four women are needed for the baking of battaw. One woman cuts the dough, shapes a ball and drops the ball onto the matroha. The second woman flattens the loaf on the matroha using a flipping motion of the matroha which causes the bread to go up into the air, spin around, and fall back onto the matroha. Each toss causes the loaf to become thinner and flatter. The third woman puts the loaves into the oven and removes them when they are done. The fourth woman, if present, assists by carrying the baked loaves away, by bringing fuel to the oven, and by mixing more dough as it is required.

The battaw at Assiut contained only wheat flour, yeast, salt and water. It was a very high moisture dough--more like a batter. Sometimes maize or sorghum are used, and sometimes fenugreek is added to the battaw at Assiut.

The battaw from Beni Suef had more brown spots and more holes than the battaw from other locations. It also had a higher moisture content than the doughs from Minya. Battaw is baked in a very hot oven maintained at high temperature with the constant addition of fuel.

Thin battaw dough in Durunka.



Table II. Battaw Bread

Location	Beni Suef	Al Borgaya	Magousa	Durunka
<b>INGREDIENTS</b>				
Wheat Flour (82%)	9.0 K		0.80 K	10 K
Maize Flour	2.9 K	19.60 K	9.85 K	
Fenugreek	90.0 G	400.0 G	300 G	
Salt	120.0 G	200 G	100. G	
Water	70.0 %	65-70 %	65 %	95 %
Dry Weight of loaf	211.2 G	170 G	179 G	

Maize and fenugreek are mixed before milling. One or both may be roasted before milling.

Fenugreek was added at the level of 3% of the maize flour in Beni Suef, 2% of the maize flour in Al Borgaya, and 1.5% of the maize flour in Magousa. No fenugreek was added in Durunka.

## RA'ROU' or MASHTOUAH

### Sentimeh

Sentimeh is known for the variety of breads made there. Many of the breads are made with a sourdough starter. One day during the first week of August, the day of the dew, all of the bakers in Sentimeh start their chamiira or sourdough. A small amount of flour and water are placed in a bowl and the bowl is placed on the roof. Each day the starter is replenished with more flour and water. The starter is a thick paste of 40 - 45% moisture. Before baking, the baker goes to all of her neighbors and gets some of their starter to mix with part of her own. The baker reserves 1/3 of her starter which she replenishes for the next time. She mixes the other 2/3 of her starter with the pieces she has obtained from her neighbors and uses that for the fermentation of her bread. Fermented breads include balady bread, amh bread, and the ra'rou' or mashtouah.

The women showed great pride in their baking and in their community. When the baker was asked where she learned to make this bread she replied that her mother taught her, and that her grandmother had taught her mother, and so on. The bread that was prepared was called ra'rou' or mashtouah. It contained okra which the women claim adds strength to the dough and prevents cracking. Ra'rou' or mashtouah is a thin, crisp bread. It is sprinkled with water and covered with a cloth in order to freshen it before eating, or it is crushed and eaten in milk or soup.

### INGREDIENTS

ITEM	AMOUNT
Wheat flour (82% local)	2 K
Wheat flour (82% imported)	1 K
Corn flour	4 K
Okra flour	400 G
Salt	50 G
Sour Yeast	500 G
Water, 40 degrees C	75-80 %

### TOOLS

ITEM	MATERIAL
Sieve	Manchol Wood, Plastic, Silk
Bowl	Maggour Aluminum
Pitcher	Plastic
Paddle	Matroha Hard Wood Strips
Tray	Halla Metal

### OVEN

Location	Inside
Shape	Rectangular
Material	Brick and Clay
Hearths	Clay, Iron
Fuel	Corn stalks and gella

### PROCEDURES

Before the baking day, the baker had obtained some locally grown wheat, cleaned it, washed it, and had it milled at the

local stone mill. The wheat and corn flours were sifted into the mixing bowl. They were mixed together by hand. Water, which had been heated to about 40 degrees C was added and the dough mixed by hand for 6 minutes and 5 seconds. The okra flour was sprinkled on top of the dough and more water poured over it. The water and okra flour were mixed into a slurry on the surface of the dough. The dough and okra-water slurry were mixed into the dough using a scrubbing motion which the baker said made a uniform mixture. She then added the sourdough starter and mixed it for another 4 minutes and 45 seconds. The mixing was done first using the scrubbing motion, and later by cutting the hands through the dough, then lifting the dough about 1/2 meter into the air, then folding it over and throwing it to the far side of the bowl. This movement stretches the gluten to overwork it and incorporates air into the dough. The air promotes oxidation which is important in the formation of the gluten network. Mixing-kneading continued for another 4 1/2 minutes.

Water was poured over the surface of the dough to make a thin layer. The bowl was placed in the next room to allow the dough to ferment for about 1 hour. While the dough was fermenting, wheat bran, corn bran and flour were sifted, then mixed together to use as a thin layer under the loaves. The fire was started and when the hearth was hot, it was cleaned by dragging a wet, soapy rag over it. The metal rod was used to move the rag around.

Water was added to the surface of the dough prior to dividing, and during the dividing process. The final dough had about 75-80% moisture. One woman divided the dough, one woman shaped the loaves, and a third woman did the baking. A handful of dough was scooped out of the bowl, dipped in flour, then tossed and spun with the matroha until it formed a thin round loaf as large as the matroha could hold. The loaf was then tossed onto the larger matroha. The loaf was further flattened, and then tossed onto the hot hearth to bake. The loaf was baked 2 - 2 1/2 minutes, then was pulled to the front of the hearth and turned over to bake for another 30 seconds.

This bread is baked every 7 to 10 days, and usually a batch of 20 K of flour is made. The family also used the bread from the government bakery. They continue to bake because the homemade bread is better liked by the family, although it is expensive to make when compared to the cost of bread from the government bakery. This bread is stored in wooden boxes that have been lined with a layer of ground black pepper mixed with coal. Because it is a dry bread it can be stored indefinitely.

#### COSTS

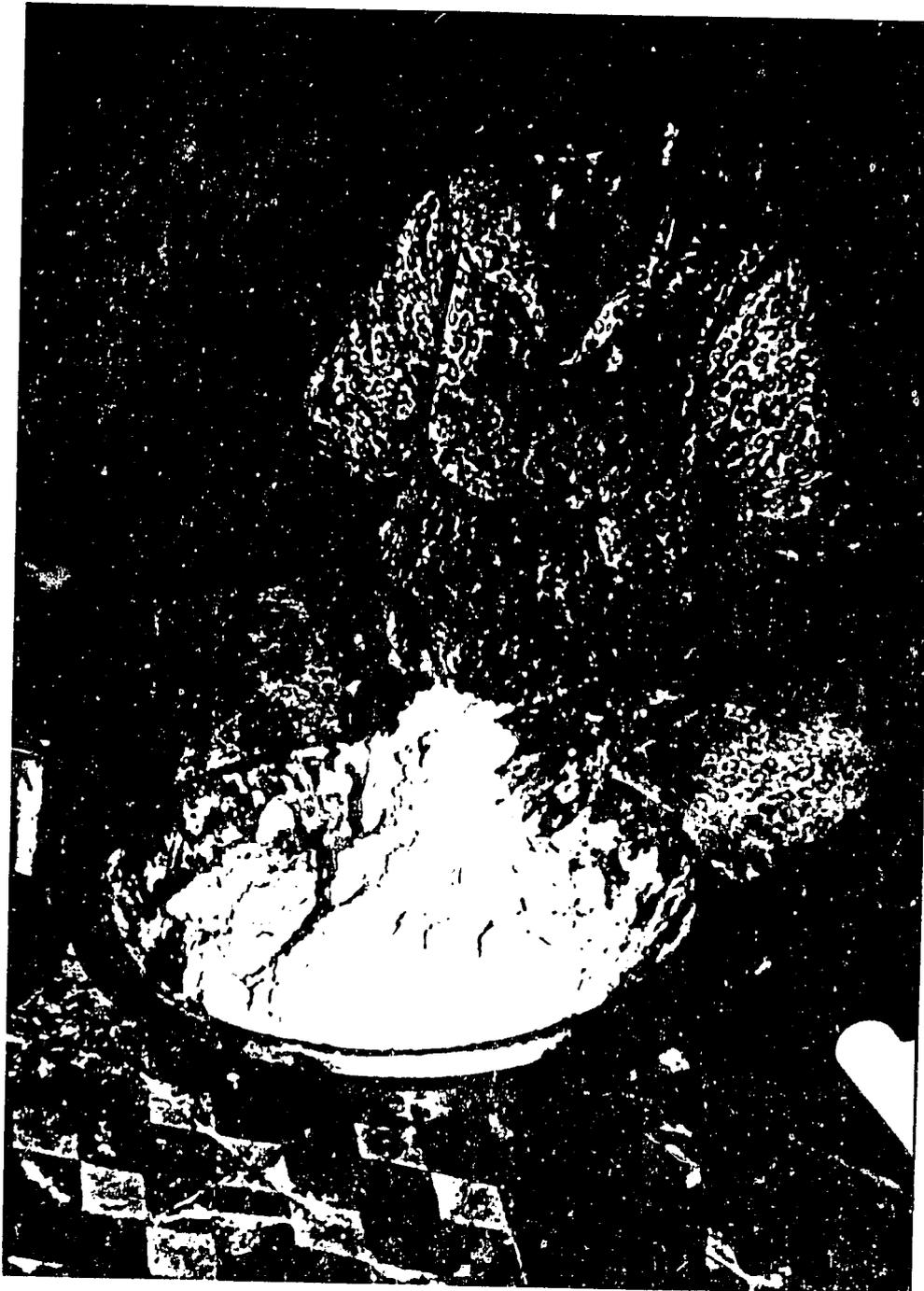
ITEM	COST
Woman	1.50 LE
Fuel and Oven	1.00 LE
Ingredients and milling	1.62 LE
TOTAL	4.12 LE

This batch made 50 loaves of bread at a cost of 8.2 piasters per loaf or 5.4 piasters per 100 g.

Adding water.



Mixing the dough.



Kneading the dough.



Flattening the dough.



Flattening the dough.



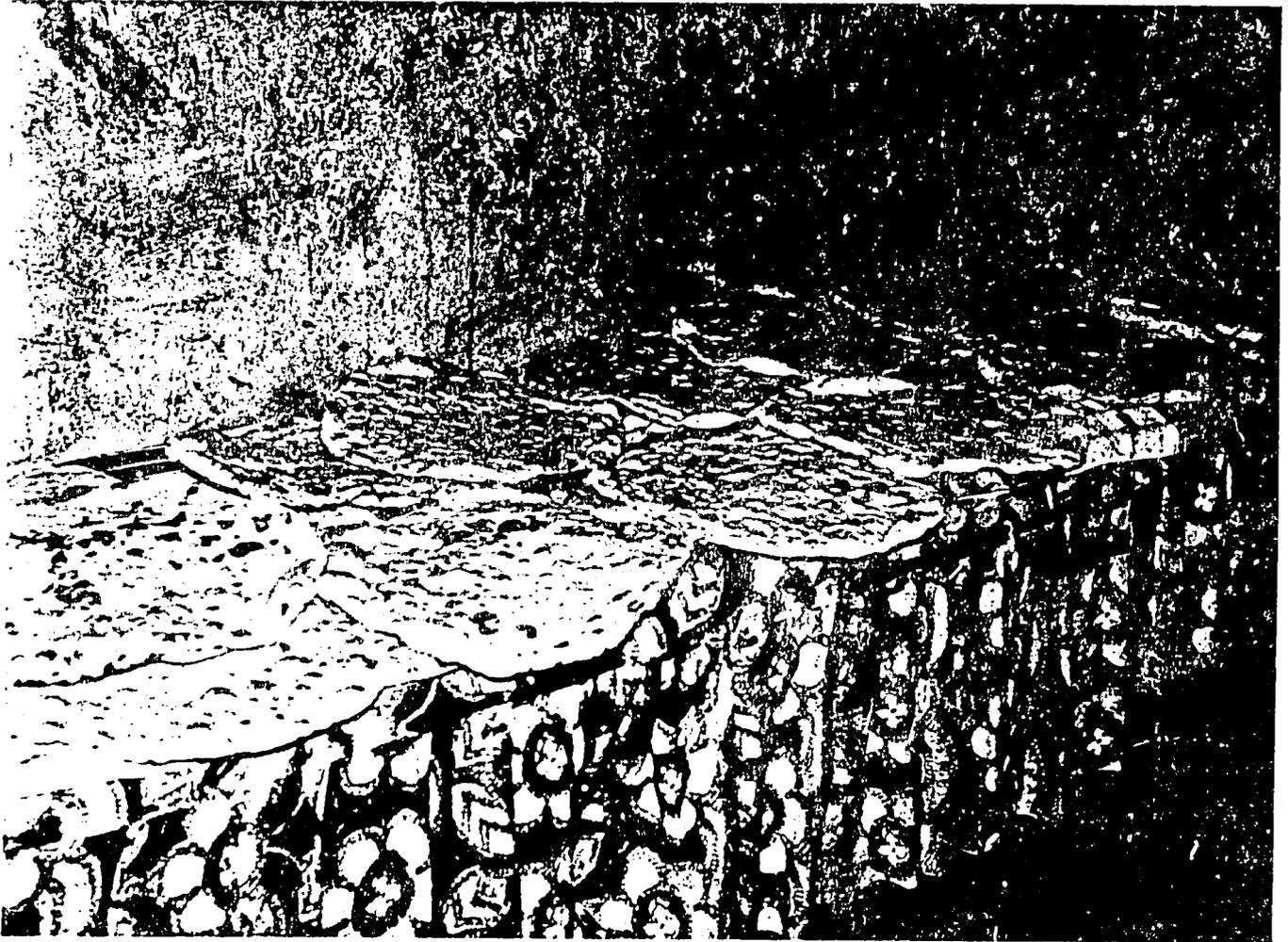
Baking the bread.



Preparing the sourdough.



The finished bread cooling.



## FITI BREAD

### Aswan--Solheil Village

Solheil Village is a Nubian village near the first cataract of the Nile. People have been living there for 3,000 years in much the same way they live today. Fiti bread is a Nubian bread. When sorghum flour is used, the bread is called senesen bread. Fiti bread is a quick, unleavened bread. It is made in a manner similar to pancakes. It is made from a batter and is cooked on an oiled griddle, called a doka. It is prepared every 2-3 days and is eaten when it is prepared. It is served for any meal. It is dipped in honey or molasses, dipped into soup, eaten with vegetables, eggs or meat.

### INGREDIENTS

#### ITEM

Wheat Flour (82% local)  
Salt, about 1%  
Water to 120-130%  
Oil for doka

### TOOLS

ITEM	MATERIAL
Bowl	Tin Can
Measuring cup	Metal
Doka (Griddle)	Metal

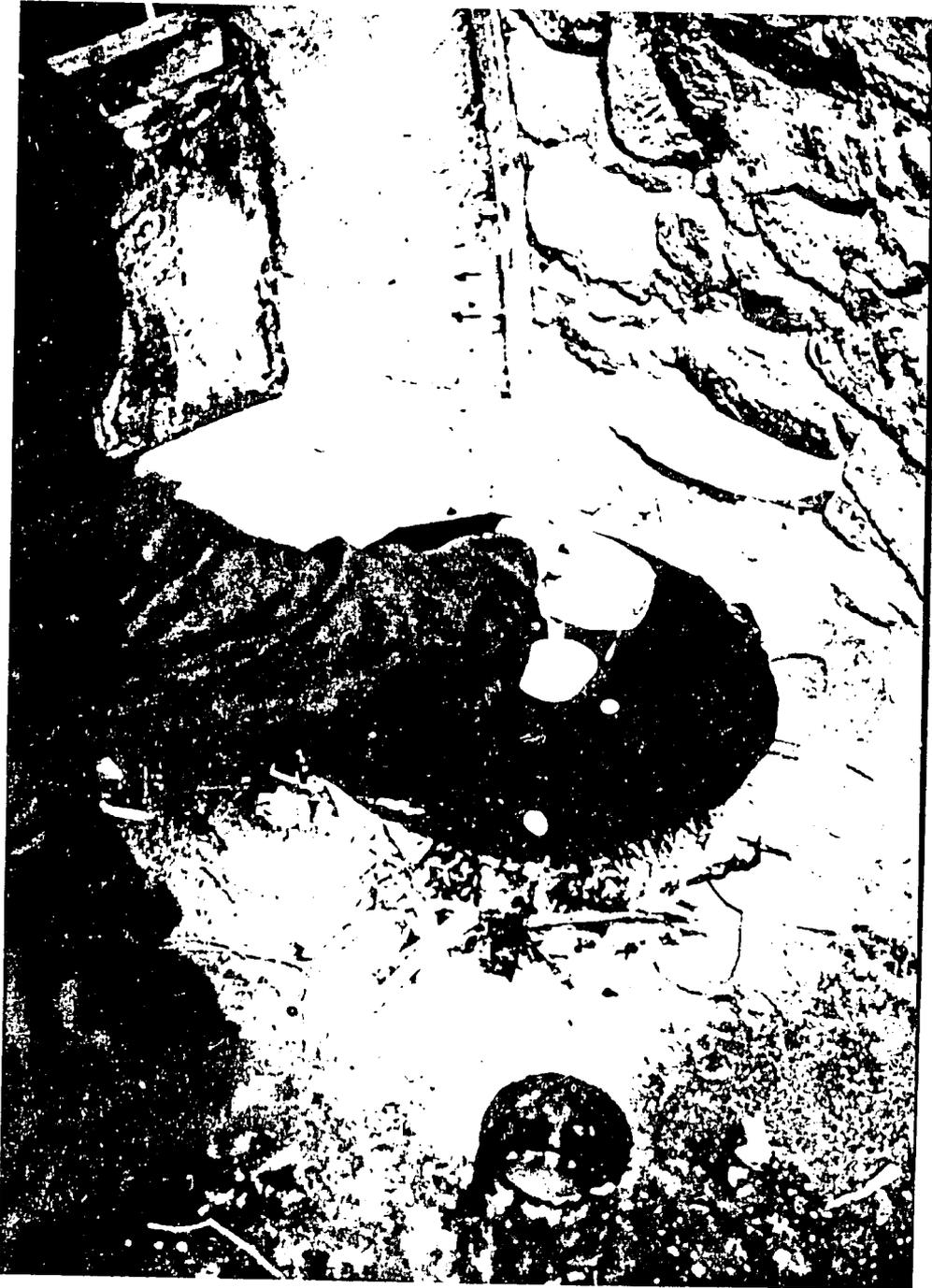
### OPERATIONS

The water, flour, and salt were mixed together to make a thin batter. A fire was started under the doka. The doka was oiled with vegetable oil to keep the bread from sticking. About 200 ml of the batter was poured onto the griddle. It was spread out with the bottom of the cup forming a spiral design. When bubbles formed on the surface, the bread was turned over. A case knife was used to loosen the bread from the doka, but the bread was turned over with the fingers. This batch made 3 loaves at a cost of 2.5 piasters per loaf or 3.9 piasters per 100 g.

Heating the doka and coating it with oil.



Pouring on the bread batter.



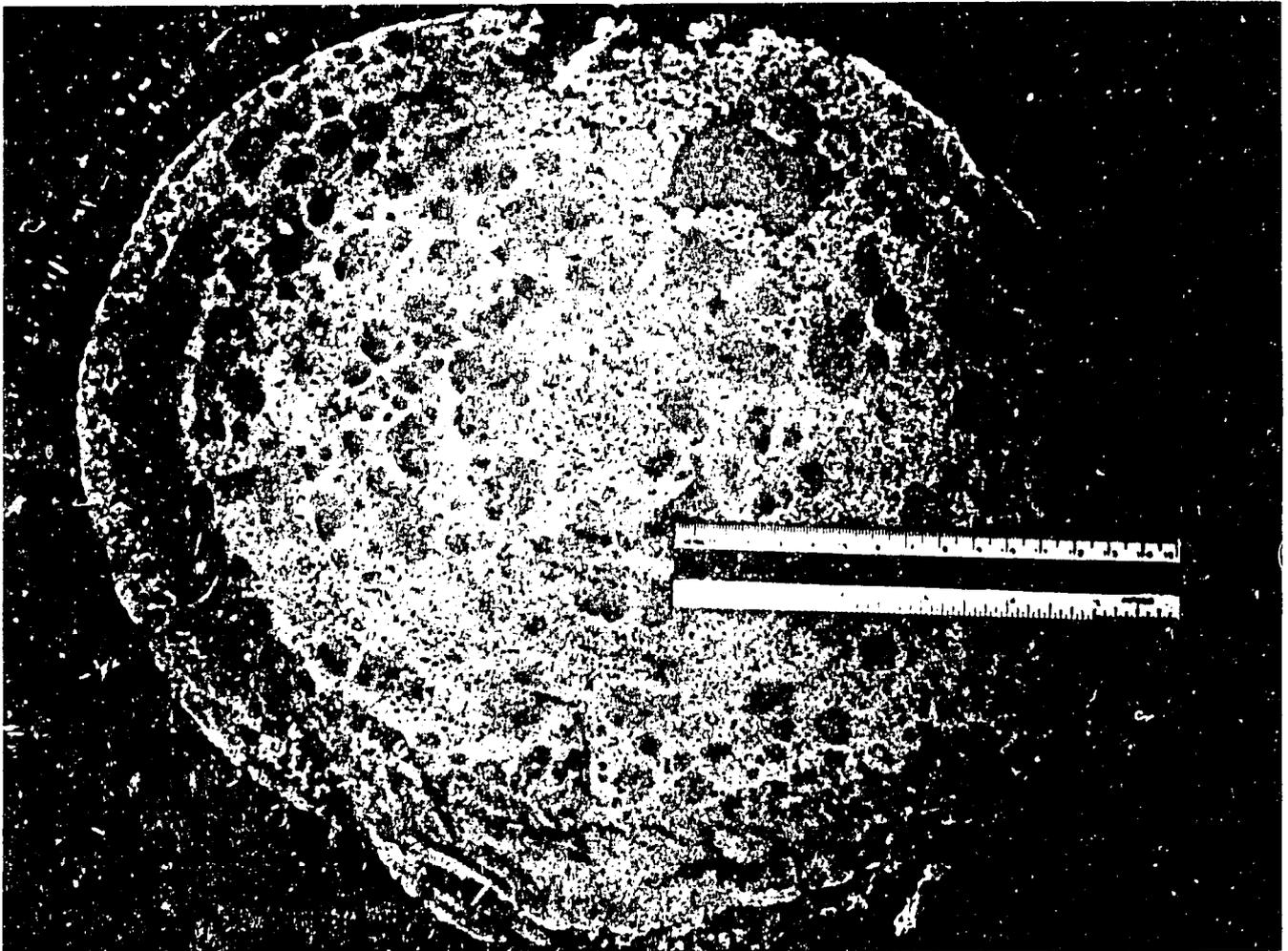
Spreading the batter and making a spiral design in it.



Baking the bread and the finished bread.



The baked fiti bread.



#### SUPPLEMENTARY INFORMATION

Solheil Village is a Nubian village near Aswan. A few interesting bits of information were gathered while there. The home where the bread was made had a new bride. The woman was married just seven days earlier. In the Nubian manner, the bride and her new husband were at home in the home of the bride's parents. They will live there at least 2 months. We were told of one couple who, after two years asked permission to establish their own home. The parents asked "Have we been mean to you?" and the couple replied that they had not been mean. The parents then said "Stay". The same was repeated after six years, and even more, until the man and his wife were grandparents.

Friends of the bride came to visit while we were there. They brought gifts of food carried in a basket on their head. One woman, for her gift, will do the housekeeping for the new bride for one month.

The Nubian houses were very large and very clean. They had domed, mud ceilings and roofs. The women still carry water, only now it is brought from Aswan by donkey cart rather than taken from the Nile. The homes have electricity, and TV antennas were visible on many of the houses. The house that we visited was highly decorated with colorful paintings and streamers. We were served shalaya, a noodle prepared with milk and honey. We were told that it is a special food usually served to the newly-wed couple on the morning after the wedding.

The Nubian interpreter was Anwar. He was well known in the village and was greeted by all that we passed--old women, young women, children, and men. He was quite amused by my interest in the breads. He made a valiant effort to translate for me. With his pidgeon English and my pidgeon Arabic, we tried to talk to the Nubian baker who spoke neither English nor Arabic. It was a delightful experience. The face of the woman who baked for us was tattooed, a custom that is not usually practiced today.

## MAJORDAG

### El Alemain

The Bedouin people were nomadic--they lived in tents and moved around the desert. Their nomadic lifestyle dictated that their cooking tools must be something that could be carried on the back of a camel. They had to make breads that were quick, easy, and which used the available food supplies. Majordag is an unleavened bread that is baked on a flat sheet of metal that is supported on some rocks and that is heated by a small fire. The small fire is important because of the lack of vegetation on the desert.

### INGREDIENTS

Wheat flour (local 82% extraction)  
Water (55-60%)  
Salt 1%

### TOOLS

Griddle	Drum lid
Roller	Stick
Bowl	Aluminum

### OPERATIONS

The water, flour, and salt were mixed together in an aluminum bowl. The dough was kneaded until it formed a very smooth ball. The dough was divided into small balls, and each small ball was rolled to about 3 - 4 mm thickness. The flattened loaf was placed on the hot griddle for about 1/2 minute, and it was then turned over. After being turned several times, it was considered to be done. This batch made 36 loaves at a cost of 3.5 piasters per loaf or 2.6 piasters per 100 g.

The bread is eaten fresh with cheese, honey, meat, or vegetables. It is torn into small pieces and mixed with dates and melted butter to make mafruka.

Mochamer is a similar bread, except that it contains yeast and is baked on a clay griddle. It can be made from flour of barley, wheat, or maize.

Garassa is a bread made from barley flour, water, and salt. It is formed into balls which are thrown directly into the fire to bake.

Mogatah is a bread made from flour, water, and salt. The stiff dough is rolled flat and very thin. It is baked in the oven. It is sometimes partially cooked in the oven, then cut into small pieces and finished cooking in tomato sauce.

Dividing the dough.



Flattening the loaves.



The griddle.



Baking the bread.



Making mafruka.



Enjoying the mafruka.



## DISCUSSION

The preparation of a number of Egyptian village breads was observed, and the preparation of several others was described for me. The formulations, tools and techniques of making the village breads have been described and presented in photographs. The tradition of the woman baking the family bread is very strong in some areas and it would be considered a disgrace to purchase bread from the bakery. In the cities there is a lack of ovens and fuel to burn in them, so the people purchase their bread from the bakery. According to the Nubian and Bedouin men, their women do not work so they have more time to spend on food preparation. They do creative and different things with the bread formulations. Baking day is a social event in the villages. It is a time for the extended family or friends to get together and help each other.

Bread is very important in the diet of Egyptians, with bread making up 70% of the food consumed. The cost of making bread in the home varies from 5 to 20 piasters per loaf. If the family has to purchase flour and fuel, the cost is greater than if the family raises the grains and uses farm waste for fuel. Bread purchased from the bakery costs 1 or 2 piasters per loaf. The cost of making bread, the low price of bread from the bakeries, and the difficulty of finding the desired kinds of flour are all contributing to a decrease in the number of women baking at home. It also contributed to the inability of the women to make some of the special breads that required the use of flours that were unavailable.

The practice of putting the fuel--maize, rice, and cotton stalks--on the roof has several hazardous characteristics. The materials are flammable and a stray spark has been known to ignite the fuel reserve and ultimately to destroy a whole village. In addition, the materials provide nesting places for all kinds of vermin--rats, mice and insects. The practice of stripping all organic material from the fields must ultimately strip the soil of its nutrients and of its water holding capacity. The oven that burns kerosene or diesel fuel would overcome these hazards and would allow the organic material to be returned to the soil. It may not be economically feasible to make such a change on a wide basis.

One final consideration would be the institution of a research program to develop automated or semi-automated bakeries for shamsy bread, as suggested by Dr. Farouk el Talawy. The option of purchasing a popular, good quality bread could be of great help in reducing the waste of such a precious resource--bread.

Table III. A summary of ingredients and a cost analysis of home baked Egyptian breads

Sample and Location	Flour				Yeast Gm	Salt Gm	Water L	Total Dough Gm	Loaf Dough Gm	Fresh Bread Gm	No. of Loaves	Cost	
	Wheat 72 %	Wheat 82%	Corn K	Other K								per Loaf	for 100 GM
<b>Shamsy</b>													
Beni Suef	3	2	-	-	10	32	4.5	9542	429	337	28	7.9	2.3
Durunka	-	20	-	-	20	200	17.5	37500	300	269	100	6.6	2.4
Luxor	-	15	-	-	-	-	-	-	340	305	80	6.2	2.1
New Valley	10	5	-	-	-	150	9.75	24750	340	305	73	8.8	2.9
<b>Balady-Type</b>													
Balady-Beni Suef	3	2	-	-	10	32	5.9	10000	267	157	36	6.1	3.9
Tourist-Cairo	10	-	-	-	100	150	10.0	20250	100	71	200	2.5	3.5
Mabbatot-Kafr Kazel	-	7.5	2.5	-	100	100	8.5	18650	150	94	120	3.3	3.1
Manottot-Nazlah	2.4	9.6	-	-	30	100	12.5	24630	514	462	48	9.3	2.0
Kabbouri-Kafr Kazel	-	7.5	2.5	-	100	100	8.5	18600	310	238	60	6.6	2.8
Hanuun-Edfina	-	12	-	-	30	120	7.2	19350	198	161	98	4.2	2.6
Bakuun-Burg al Arab	4	-	-	-	10	40	3.6	7600	230	179	35	3.7	2.1
Amh (Tari)-el Omaid	10	-	-	-	100	100	8.0	18200	400	240	45	7.8	3.2
Amh (Nashif)-Sentimeh	7	3.0	-	-	50	100	8.5	18650	180	140	100	3.7	2.7
Amh (Nashif)-Nubaria	-	8	2.0	-	50	100	-	-	-	-	-	-	-
Amh (Nashif)-el Omaid	-	7.5	2.5	-	100	100	8.0	18200	127	70	143	2.5	3.6
Fellahi-Edfina	-	12	-	-	30	120	7.2	19350	196	152	98	4.2	2.8
Majordag-el Alemain	-	4	-	-	-	-	2.0	6000	162	134	36	3.5	2.6
Fiti-Aswan	-	0.2	-	-	-	-	0.3	500	180	64	3	2.5	3.9
<b>Battaw</b>													
Durunka	-	-	10	-	100	100	12.0	22200	-	-	-	-	-
Beni Suef	-	3	0.97	0.03	-	-	4.0	8000	380	211	20	8.1	3.8
al Borgaya	-	-	21.6	0.4	-	200	15.4	37400	309	170	120	7.5	4.4
Magousa	-	1.6	19.7	0.3	-	200	14.2	35970	326	179	110	7.9	4.4
Mashtouah-Sentimeh	2	1	4.0	0.5	750	80	7.0	14580	288	153	50	8.2	5.4
<b>Breakfast Breads</b>													
	Sugar K	Flour K	Milk L	Butter K	Yeast Gm	Salt Gm							
Faish-Durunka	1.5	10	1	1	100	-	-	13600	84	73	160	6.6	9.8
'Orus	-	4	1	1	10	-	-	6510	80	72	76	11.7	16.3
'Ara 'Iish	-	12	2	1	20	120	-	15140	111	87	125	10.6	12.2

Notes:

Costs are based on imported flour at 30 piasters/K, local flour at 12.5 p, corn flour at 20 p, fenugreek at 180 p, and okra flour at 20 p/K.

Sorghum is preferred for Battaw in Durunka and for fiti (which is then called senesen) in Aswan.

Fenugreek is an aromatic legume seed that is roasted and milled with the maize.

Okra flour is prepared by milling the dried pods.

Breakfast breads may also include dried sweet dates called "aqua" ('orus), sesame seeds ('orus and 'ara 'iish), or

flavoring oils (banana was used in the 'orus).

## APPENDIX

In the course of this research villages from Aswan to el Alemain were visited. According to Baedeker's Egypt Personal Tourguide, there are 21 governorates and 4 frontier districts in Egypt. Cairo is one of four city governorates. Governorates that were visited in lower Egypt include Daqahliya, Gharbiya, Buhayra and Damietta. Central Egypt governorates that were visited include Giza, Fayoum, Beni Suef and el Minya. Upper Egypt governorates that were visited included Assiut, Qena and Aswan. The frontier governorates that were visited included New Valley and the North-West Region. The villages and governorates are listed below, to the best of my ability to determine from the maps that are available.

### EGYPTIAN VILLAGES VISITED

<u>Village</u>	<u>Governorate</u>
Dokki	Cairo
Beni Suef	Beni Suef
Durunka	Assiut
Luxor	Qena
Kharga	New Valley
Kafr Kazel	Minya
Nazlah	Fayoum
Sentimeh	Damietta
el Omaid	Daqahliya
Nubaria Station	North-West Region
Edfina	Buhayra
Burg al Arab	North-West Region
al Borgaya	Gharbiya
Magousa	Gharbiya
Aswan	Aswan
el Alemain	North-West Region

The inhabited area of Egypt includes the delta area, a strip of land that is 6-12 miles wide from Cairo south for about 930 miles, and there are villages at the various oases. I have tried to show the locations of the villages on the attached map of Egypt.



## RECOMMENDATIONS FOR FUTURE RESEARCH

Specific recommendations for future research related to bread baking include 1) work with the development of automated or semi-automated bakeries for true balady breads, 2) work with the development of automated or semi-automated bakeries for shamsy bread, 3) work with the development of commercial sourdough cultures that could be used with the balady and shamsy breads. Future research should be directed to evaluating the new varieties of grains coming from the Egyptian Major Cereals improvement Project for their suitability in making the village breads of Egypt. The Wheat Quality Laboratory is testing the varieties for suitability in balady and shamy breads as made in the government bakeries.

The project director, Dr. Coleen Brown, and the EMCIP Women's committee are involved in further defining the role of women in agriculture. In relation to this research, Dr. Brown is requesting that two more WID Fellows come to join the project to do some case studies to help define the changing roles of women.

Projects not directly related to breads include the development of irrigation projects in the Kharga Oasis area. Dr. Farouk Talawi is very interested in two aspects of this problem: first to drill deep wells and second, to build a canal from Lake Nasser and to build suitable irrigation networks from these two sources of water.

## SIGNIFICANCE OF THIS PROJECT

There is a project underway to evaluate the costs of producing bread and to determine the amount that is actually consumed by humans. The information gathered in the current research will be used to help fill the data base for that project. The information will be used by Dr. Khorshid and the Supply Ministry in determining how to best utilize the precious food commodities that are available. The information gathered in this survey will be used by Dr. Khorshid as he works on the history of bread display for the Egyptian Museum. The survey gives data on the multiple factors related to baking bread in the homes. The awareness of the women that strong gluten makes good bread should be considered by the breeders as they work on new varieties of wheat for Egypt. Research in agronomic practices that will produce wheat with strong gluten should be a part of the Egyptian Major Cereals Improvement Project. The information on preferences for specific grains can be used to determine where, and how much acreage should be devoted to the other grains. The survey gives vital information on the time cost of making bread for the family, and on the financial burden of feeding the family, all of which relates to the role of women in Agriculture. The fellowship research provided information that was requested regarding the preferences of women for various types of flour.

As the nutrient analyses are completed the information will be of special interest to the Nutrition Research Institute. The information will also be used by researchers in the Agricultural Research Center.

## BENEFITS TO WID, AID, AND THE UNIVERSITY OF IDAHO

As a result of this fellowship, one researcher, Karen R. Davis, received valuable training for International Development Work. That training came not so much from the research, but from observing the activities in the office of Dr. Coleen Brown. The experience and training make K. R. Davis more marketable for future development work. As a result of the work of Davis, contacts were made which may produce positions for other WID Fellows in Egypt. The report gives background information on Egypt that, prior to this time, has not been available in one place for English speaking researchers. The information is appropriate as a background for work in sociology, anthropology, foods and nutrition, and cereal technology, and should be valuable for any project that affects the agriculture, the availability of fuel, or the lifestyle of the Egyptian village people.

The information contained in this report is valuable to the University of Idaho, the Idaho Wheat Commission, the Oregon Wheat Commission, The Washington Wheat Commission, the Western Soft White Wheat Quality Laboratory in Pullman, Washington, the Idaho Wheat Quality Laboratory, and to the U. S. Wheat Associates, all of whom sell soft white wheat such as is used in Egyptian breads. Information contained herein gives valuable information that can be used in quality testing and marketing of our soft white wheat.