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The Seasonal Employment Profile in Egyptian Agriculture

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1. Introductory.

The present paper contains a revision and extension of an estimate of labour requirements in Egyptian Agriculture earlier carried out and published by the Ministry of Agriculture, Cairo.[1] The estimate of the Ministry of Agriculture suffers from various defects which will be made clear in the sequel. Some of these defects could, however, be remedied and although even the revised and extended estimates are open to various kinds of criticism, they do nevertheless offer some information on the employment situation in agriculture. Another statistical material illuminating this problem will soon be available from the ILO - INP-sample survey of village-employment at present under work. This latter sample survey will probably supply us with a much more detailed, reliable and complete information of village-employment than has hitherto been available in this country. Since, however, the ILO - INP-sample does not permit inflation to a national level, while on the other hand the Ministry of Agriculture estimate is in principle on a national basis, the estimate presented in this paper may be considered complementary to the forthcoming ILO - INP study. For these various reasons we found it justified to present our revision of the Ministry of Agriculture estimate, in spite of all its short-comings.

2. Concepts and Measurements.

In order to avoid terminological confusion we shall briefly define certain concepts related to the problem at hand. The definitions are those traditionally adopted.

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1) Agricultural Economics, Monthly Bulletin, Department of Statistics and Agricultural Economics, Ministry of Agriculture, Cairo, May 1958, March 1959, June 1960.

By open unemployment we understand a situation where persons want, but are unable to obtain, employment as wage earners at the going market wages. In agricultural districts this concept applies mainly to labourers, but also cultivators of land and their family members may be in this position. Statistics on open unemployment in rural districts in the UAR do exist, viz. the labour force surveys of the Ministry of Labour.

By disguised unemployment we understand a situation where actually employed labour could be removed, ceteris paribus, without negative effects on actual production. It is, in other words, a situation where the actual marginal (or, rather, differential) productivity of labour is zero (or negative). This concept applies mainly to cultivators and their families, but disguised unemployment of hired labour may of course exist, if either the employer is unaware of the fact that the value of the marginal product of labour is lower than the wage rates, or institutional circumstances force upon him superfluous employees. It follows from the very definition that disguised unemployment can only be disclosed either through controlled experiments (dismissals, for instance) or through a statistical estimate of the production function, which will permit a calculation of the marginal productivity of labour. This has been done for a number of countries, both on a cross-section and a time-series basis, and it seems rather clear that if the marginal product is defined on an annual basis then disguised unemployment is a rare phenomenon and the exception rather than the rule in agriculture in underdeveloped countries.[1)]

Underemployment, finally, is a concept which only applies to the entrepreneur - the cultivator - and his family together with employees hired

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1) Reference can here be made to a number of studies, see in particular Colin Clark and M.R. Haswell, The Economics of Subsistence Agriculture, London 1964 and Theodore W. Schultz, Transforming Traditional Agriculture, New Haven and London, 1964, Ch.4. For the UAR, see Hanaa Kheir El Din, "The Cotton Production Function in the UAR and its Relation to Technical Progress and to Disguised Unemployment", INP Memo. No. 370, Cairo 1963. Let it be added that other attempts in the UAR to estimate or guess the size of disguised unemployment are actually not at all concerned with disguised unemployment as defined here, but with estimating an average of the agricultural seasonal underemployment as defined below, see El Zalaki etc. "Agricultural and Non-Agricultural Unemployment in Egypt", Research Bulletin No.1, Sept. 1957, Department of Agricultural Economics, Faculty of Agriculture, Alexandria 1961.

on a long term basis, and which means that persons attached to the enterprise, the farm, do not find full time employment on the farm; they may be trying to find employment outside the farm in which case they are also open unemployed. Underemployment obviously presumes that the marginal productivity of labour is zero and that the cultivator is aware of this.

To each one of these three concepts we can apply the distinction between seasonal and permanent (i.e. annual or perhaps "rotational"). This distinction is well-known from discussions of both open unemployment and underemployment, while it is usually not applied to the concept of disguised unemployment. Since, however, the marginal product of labour may in principle be measured on a crop-basis rather than on an annual basis (or a rotation basis)[2], something which is of interest in an agricultural system like the Egyptian with "continuous" cropping, we have the following concepts:

1. Open unemployment
   a) seasonal
   b) permanent

2. Disguised unemployment
   a) seasonal
   b) permanent

3. Underemployment
   a) seasonal
   b) permanent.

This paper is concerned with the measurement of underemployment, seasonal as well as permanent, and only in a very indirect way does it throw some light on disguised unemployment. An attempt is made to draw up an "employment profile" on a monthly basis, showing how many days of each one the twelve months of the year an average member of the permanent farm labour force would have to work in order that the labour requirements for plant

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1) For measurement on a crop basis, see Hanaa Kheir El Din, op.cit. For measurement on an annual basis, see Mohamed Mahmoud El Imam, "A Production Function for Egyptian Agriculture 1913-1955", Memo. No.259, INP, Cairo 1962.

production be satisfied. This calls for definitions of what is understood by "an average member of the permanent farm labour force", and by "labour requirements for plant production".

The statistics of "permanent farm labour" are taken from the agricultural census of 1950. The published census does not provide a definition of this concept, but according to information from the Ministry of Agriculture it includes all/grown-up males permanently on the farm, married women to the extent they actually take part in field work, and all/unmarried women and children 12 years and above. Servants together with seasonal and occasional workers are not included. This definition is not perfectly clear and one may wonder how it has been interpreted in collecting the primary data. Since figures are only available from the 1950-census, it has been assumed that the permanent farm labour force has stayed constant during the 'fifties.[1] This assumption is to some extent supported by the population censuses which show almost constancy in the number of "persons economically occupied" in agriculture from 1947 to 1960. But obviously this is a key-assumption which may easily be criticized.

Permanent farm labour has been divided into two groups: "men" (all males 15 years and over), and the rest labelled "women & children". Within these two groups labour is considered homogeneous and the unit of measurement is 1 person's work per day. The distinction between "men" and "women & children" is related to what is traditionally considered work for "men" and for "women & children". There is, however, in real life no hard and fast distinctions here and we shall show also a calculation where men, women and children have been lumped together.

Concerning the "labour requirements" information was collected in 1955 by the Ministry of Agriculture from each Governerate concerning the labour required for the various operations (soil preparation, irrigation, sowing, etc. until harvesting) necessary for each major crop, distributed on "men"-days and "women & children"-days. This information has not been collected on any systematic sampling basis; it gives only, for each Governerate, the judgement of the agricultural inspectors about what is the normal, actual

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1) Figures from the 1960 agricultural census are actually available in the Ministry of Agriculture, but it has not been possible for us to make the Ministry release these figures (or even to let us have access to them). This lack of cooperation has forced us to work on the old data.

labour input per feddan per farm operation. On this basis a weighted national average for each farm operation has been estimated by the Ministry. It will be understood that the labour requirements estimated in this way may not give a satisfactory measure of the average, actual labour input per feddan per farm operation; it is even uncertain whether we are dealing with actual inputs or with normative figures. Furthermore, minor crops were left out, and for vegetables and fruit employment statistics from agricultural research stations were used (it is beleived that the research stations use more labour than the average cultivator of vegetables and fruit).

The estimates included in principle only plant production. This means that all work related to animal production, digging and cleaning of irrigation canals and drains, building and repair of houses and implements, and trading were left outside the estimates. Also time used for the movement of labour itself to, from and between the fields is disregarded. Finally, the original Ministry of Agriculture estimates of total labour requirements were based on the crop areas in 1955, a year where both the cotton area and the rice area - the two labour intensive crops - were exceptionally small.

We have only been able to improve on some of the short-comings of the Ministry of Agriculture estimate. First of all we have not only re-estimated the year 1955, but have also made a new estimate for 1960, a year in which the cotton area was relatively large and the rice area rather normal. Secondly, the distribution by months of the work related to the individual farm operations was estimated by ourselves; the distribution used by the Ministry has not been disclosed. We assumed that the monthly distribution of all operations are related to the monthly distributions of the seeding and harvesting both of which were available for the year 1962. Also some other information was made use of. Thirdly, some minor improvements were made.[1] With respect, however, to the two main pieces of information: the permanent labour force, and the labour requirements per feddan per operation we could do nothing to improve the estimates.

On the basis of the information of the labour requirements per feddan per operation, and the cultivated area for the various crops, the total

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1) All details of our calculations are available in the Institute of National Planning.

labour requirements for men and women & children, resp., were then calculated, both expressed in mill. of days of labour per month. Dividing through by the total number of men and women & children, resp., the number of days of labour required for plant production per month per man and per woman-child were obtained. Finally, total labour requirements for men-labour and women & children-labour have been added together and divided by the total number of men, women and children in order to obtain the average number of days of labour required in plant production per member of the permanent farm labour force. The justification for doing so is that during the peaks men do actually step in and perform work which is traditionally considered work for women and children, et vice versa; the weakness of our procedure is that one unit of man-labour may not be equivalent to one unit of women & children-labour.

3. Results.

The main results are shown in Table 1 and depicted in Graphs 1-3, which do not need much explanation. The Graphs show the maximum number of working days per month (= number of days per month) and the number of week-days per month in 1960 (equal to number of days minus number of Fridays - but not other feast days - per month). We have shown both of these limits because it is difficult to say a priori what should be considered full employment in agriculture. If, however, the number of days of labour per person required exceeds the number of days in the particular month, then it seems impossible to speak about underemployment (although even here there is a problem of hours, days and nights). In each diagram we have then drawn two curves showing the labour requirement per person for 1955 and 1960, resp., in order to be able to compare the labour requirements with the physical upper limit for labour.

Since now the calculations of labour requirements only include plant production, the general level of labour requirements shown is for that reason too low, for both men and women & children. By how much is difficult to say, but a rough impression of the general underestimation of the total labour requirements involved by the omission of animal production etc. is obtained from the national income estimates according to which in 1959/60 about 24 per cent of the gross value of agricultural production and 15 per cent of gross value added in agriculture were related to animal production.

The aggregation to a national level may also, taking into account the immobility of permanent farm labour, hide local peaks and labour shortages (sugar cane is an example). On the other hand, there are factors which point in the direction of an overestimation, in particular for vegetables and fruits. The labour requirement curves probably also exaggerate the strength of the seasonal fluctuations, at least for men; digging and cleaning of canals and drains and certain other types of "overhead" work are always done during the slack winter season.

1. Accepting the estimates at their face value, the conspicuous feature of Graphs 1-3 is then the strong seasonality disclosed, the seasonality being much stronger for women & children than for men. The seasonal peaks are also different for men and women & children. While the former have a peak in May (various grain operations)[1] the latter have two peaks, one in June (rice planting and cotton worm combatting) and one in September (cotton picking).

2. The estimates supply no evidence of <u>permanent</u> underemployment in agriculture. Taking everything into consideration it follows from the estimates that for all practical purposes men may be considered fully occupied around the May-peak and probably also some time in September-October, while women & children seem to be fully occupied during most of the period June to September. Indeed, during the peaks there seems to be a need for employing occasional, hired labour, in particular for women & children-work; this fits well with the fact that there does exist a class of rural labourers which is only occasionally employed in agriculture.

3. The fact that there is during the peaks a need for outside labour, and that such seasonal, hired outside labour is actually used in Egyptian agriculture points against the idea of (annual) zero-marginal productivity of labour. The Egyptian fellah is an economical and calculating peasant who would hardly employ paid labourers unless he gets in return (at least) an equivalent in the form of increased production.

4. Concerning the years 1955 and 1960, it will be seen that the estimated labour requirements in the latter year exceed those of the former. For men the labour requirements in 1960 are higher by about the same amount

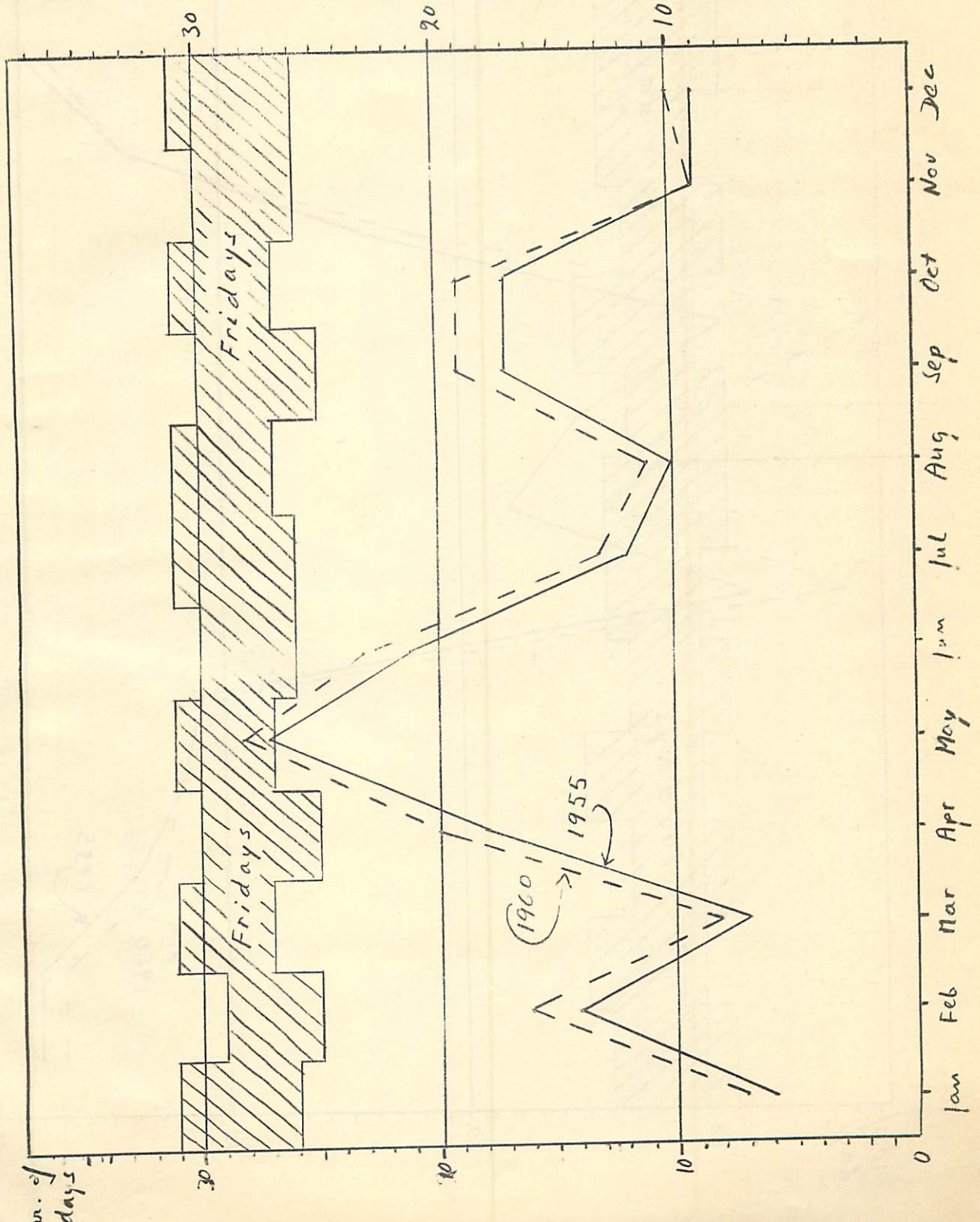
1) Maybe also in September-October where our monthly distribution made may hide a concentrated peak around the cotton harvest. In agriculture the peaks may be so concentrated that only a weekly, or even daily calculation could disclose the full strength of the peaks.

each month, and the main reason is the increase in total crop area from 1955 to 1960. For women & children the difference between 1955 and 1960 is concentrated on the peak periods, the explanation here being in the main the difference in the composition of the crop area (with relatively more cotton and rice).

Finally, it should be mentioned that those who feel uneasy about the concept and statistics of permanent farm labour used here (and in particular about the assumption of constancy from 1950 to 1960), but are willing to accept the labour requirement calculations, may interpret the curves in Graphs 1-3 as indexes only of the seasonality of total labour requirements in plant production; each one of them has been derived through dividing the monthly total labour requirements by a constant factor. But in that case, no conclusions can be drawn, of course, concerning the existence of permanent underemployment.

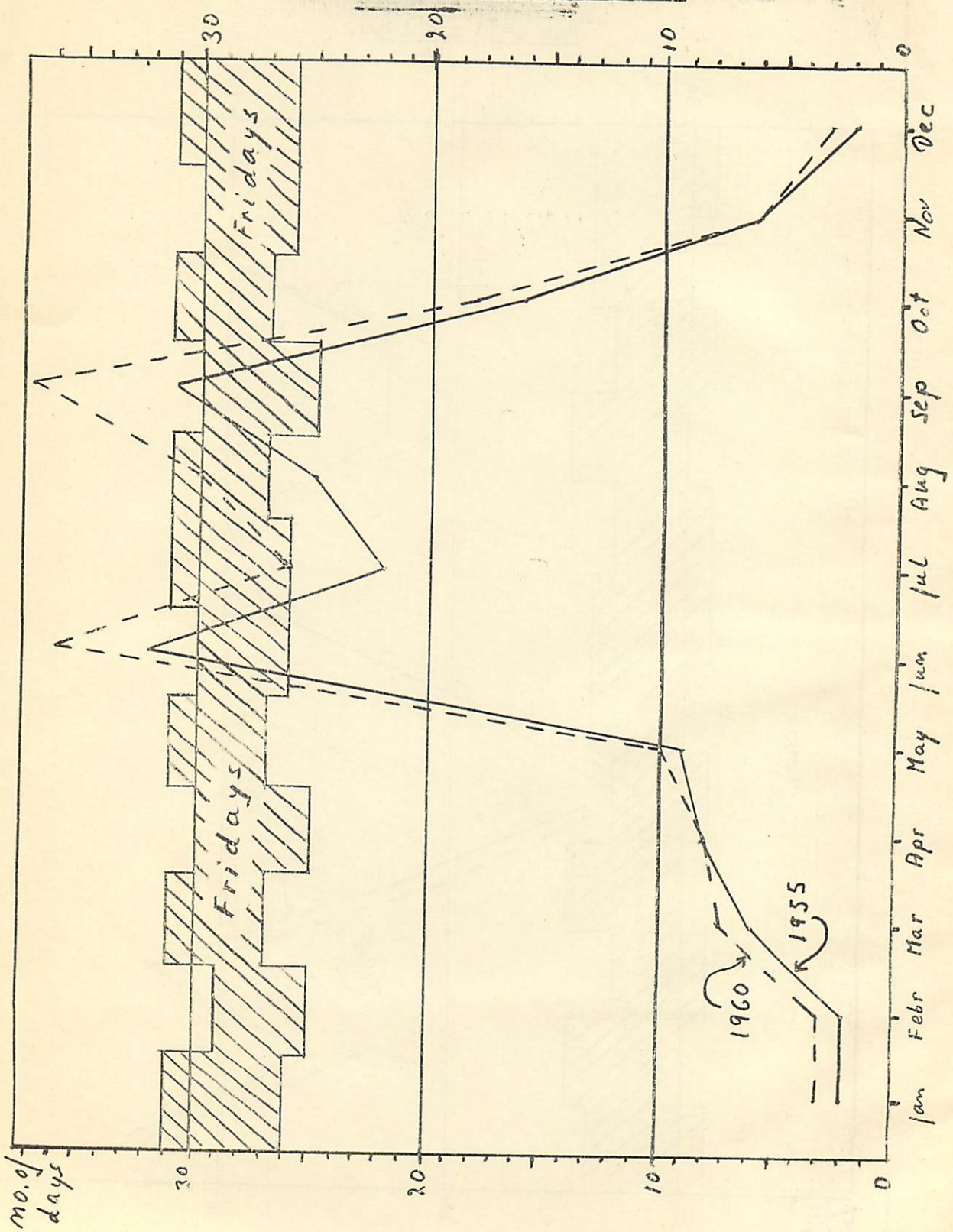
Graph 1.

Number of Days of Work Per Month Per Person Required for Plant Production.
Men: 1955 and 1960.



Graph 2.

Number of Days of Work Per Month Per Person Required for Plant Production.
Women & Children: 1955 and 1960.



Graph 3.

Number of days of Work Per Month Per Person Required for Plant Production.
Men, Women & Children: 1955 and 1960.

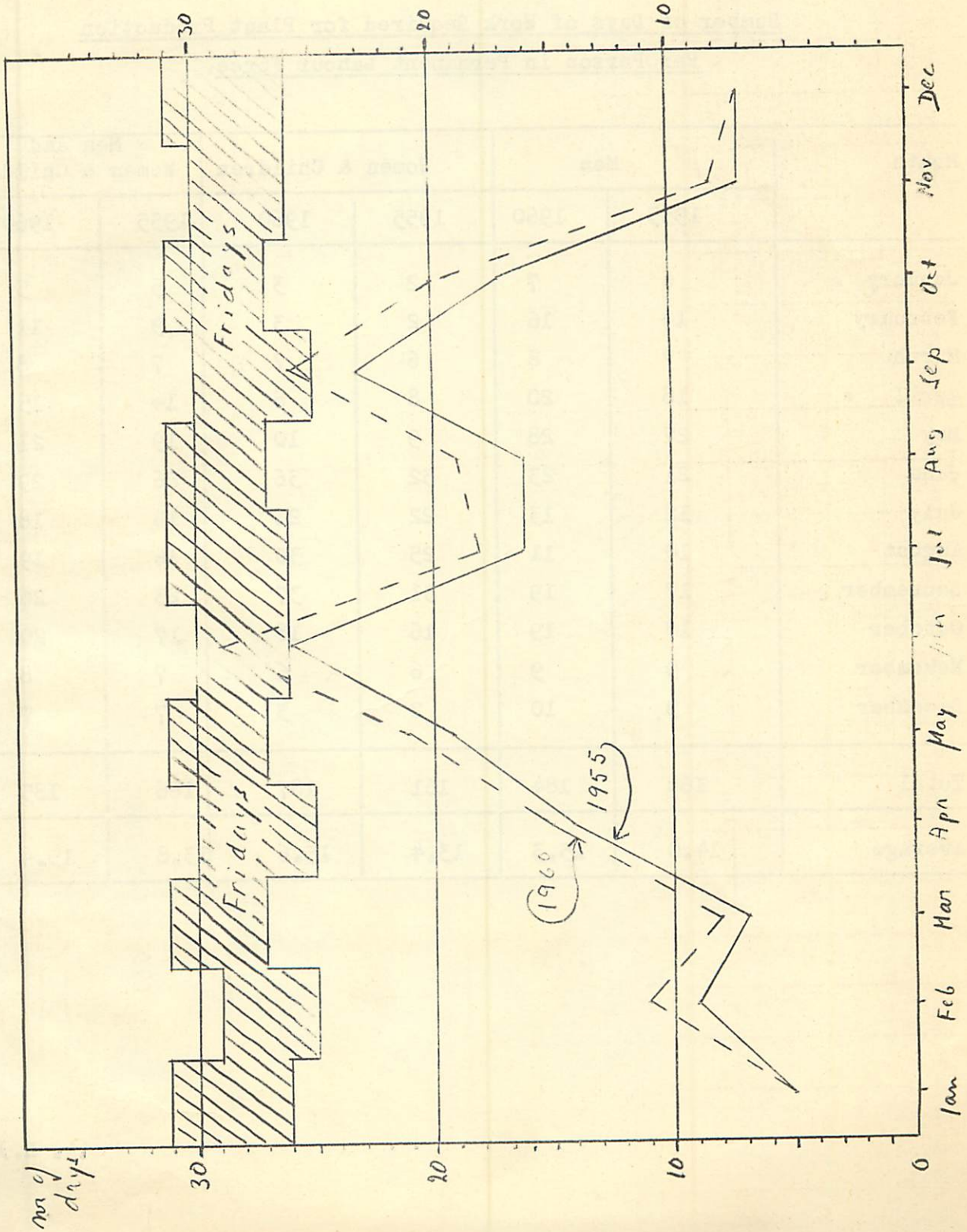


Table 1.

Number of Days of Work Required for Plant Production Per Person in Permanent Labour Force.

Month	Men		Women & Children		Men and Women & Children	
	1955	1960	1955	1960	1955	1960
January	6	7	2	3	5	5
February	14	16	2	3	9	11
Marsh	7	8	6	7	7	8
April	18	20	8	8	14	15
May	27	28	9	10	19	21
June	21	23	32	36	26	29
July	12	13	22	26	16	18
August	10	11	25	30	16	19
September	17	19	31	37	23	26
October	17	19	16	18	17	20
November	9	9	6	6	7	8
December	9	10	2	3	7	7
Total	168	184	161	187	166	185
Average	14.0	15.3	13.4	15.6	13.8	15.4

(A. H.)