Rest-pauses and refreshments in industry : an inquiry into the operation of rest-pauses and mid-shift refreshments in factories in seven industrial areas in Great Britain (with an appendix on music in factories) / by J. Ramsay, R.E. Rawson and others.

THE NATIONAL INSTITUTE OF
INDUSTRIAL PSYCHOLOGY

Founded in 1921 for the Application of Psychology and
Physiology to Industry and Commerce

REST-PAUSES AND REFRESHMENTS IN INDUSTRY

An inquiry into the operation of rest-pauses and mid-shift refreshments in factories in seven industrial areas in Great Britain
(With an Appendix on Music in Factories)

BY

J. RAMSAY, R. E. RAWSON
and OTHERS

PRICE 2*s* 0*d*

PUBLISHED IN LONDON BY THE
NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY
ALDWYCH HOUSE, W.C.2

GRATIS TO MEMBERS OF THE INSTITUTE

What the Institute does

The National Institute of Industrial Psychology, formed in 1921, deals with every aspect of the human factor in occupational life. On the one hand it aids young people to choose suitable careers: on the other hand it secures the improvement of industrial and commercial conditions by the scientific selection and training of personnel and by the investigation of factors which prevent the adjustment of workers to their occupation and its environment.

VOCATI and intelligence form part chool-leavers and others to a

INVESTI RCIAL. The investigation ase of production and organi by improvement of working lighting, heating and ventil s of organization, etc. The pr ve the hindrances which prev

PERSONN lection and training of emp romotion. Causes of friction, stigated.

MARKET stigations of consumer psy

RESEARC lems of industrial and vocati occupational life.

EDUCAT nods of industrial psychology res, addresses and demonstra uspices of universities and

PUBLICATIONS. The N.I.I.P. publishes *Occupational Psychology* quarterly and monthly news bulletins on industrial and educational matters. It also issues numerous reports and pamphlets, and maintains a library with a lending section for the special use of members. The minimum membership subscription is £1 a year, and entitles members to free receipt of *Occupational Psychology* and one edition of the *N.I.I.P. News*. Both editions may be had for a subscription of £1. 5*s*. or more.

ASSOCIATE FIRM MEMBERSHIP. A special service is offered to Associate Firm Members, the subscription for which is 25 guineas a year.

REST-PAUSES AND REFRESHMENTS IN INDUSTRY

An inquiry into the operation of rest-pauses and mid-shift refreshments in factories in seven industrial areas in Great Britain
(With an Appendix on Music in Factories)

by
J. RAMSAY, R. E. RAWSON
and OTHERS

PUBLISHED IN LONDON BY THE
NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY
ALDWYCH HOUSE, W.C.2

1939

CONTENTS

	PAGE
INTRODUCTION	
1. Object of the Inquiry	5
2. Method	6
I. REST-PAUSES	
1. Prevalence of Rest-pauses	7
2. Rota Systems	11
3. Duration and Incidence of Organized Rest-pauses	12
4. Where and How Official Rest-pauses are Spent	16
II. REFRESHMENTS	
1. Prevalence of Refreshments	19
2. Nature and Popularity of Refreshments	22
3. Supply and Payment	25
III. GROWTH OF OFFICIAL REST-PAUSES AND REFRESHMENTS	28
IV. EMPLOYERS' ATTITUDES TO REST-PAUSES AND REFRESHMENTS	
1. Reasons for Introduction	31
2. Effects on Efficiency	33
3. Objections to Official Rest-pauses	36
4. Reasons for Non-existence of Refreshments	38
5. Reasons for Abolition of Rest-pauses	39
CONCLUSIONS	41
APPENDIX I. MUSIC IN FACTORIES	
1. Prevalence of Music	43
2. Employers' Attitudes to Music at Work	46
3. Conclusions	48
4. General Comments on Music	48
APPENDIX II. STATISTICAL APPENDIX	50

TABLES

		PAGE
1.	Prevalence of Rest-pauses	8
	Summary Table	8
2.	Comparison of Organized Systems of Rest-pauses	11
3.	(i) Duration of Organized Rest-pauses—Morning	13
	(ii) Relation of Duration of Organized Rest-pauses to Length of Shift—Morning	13
	(iii) Incidence of Organized Rest-pauses—Morning	14
4.	(i) Duration of Organized Rest-pauses—Afternoon	15
	(ii) Relation of Duration of Organized Rest-pauses to Length of Shift—Afternoon	15
	(iii) Incidence of Organized Rest-pauses—Afternoon	16
5.	Where Official Rest-pauses are Spent	17
6.	How Official Rest-pauses are Spent	18
7.	Refreshment Arrangements in Factories	19
	Summary Table	20
8.	Frequency of Food and Drink, Irrespective of Rest-pause Arrangements	21
	Summary Table	22
9.	Consumption and Popularity of Various Types of Solid Food	23
10.	Consumption and Popularity of Various Types of Drinks	24
11.	(i) Supply of Food	26
	(ii) Supply of Drink	26
12.	(i) Payment for Food, when Supplied by Employer	27
	(ii) Payment for Drink, when Supplied by Employer	27
13.	(i) Growth of Official Rest-pauses	28
	(ii) Growth of Refreshments	28
14.	Reasons for Introduction of Official Rest-pauses	31

PAGE

15. Effects on Efficiency, etc., of Rest-pauses and Refreshments 33

16. Reasons for Popularity of Rest-pauses among Employers 34

17. Reasons for Non-existence of Official Rest-pauses 37

18. Reasons for Non-existence of Refreshments 38

19. Reasons for Abolition of Rest-pauses 39

20. Prevalence of Music 43

21. Duration of Music at Work 45

22. Popularity of Various Types of Music 45

23. Reasons for Non-existence of Music 48

Diagram 1. Growth of Official Rest-pauses and Refreshments. Moving Five-yearly Totals 1928-1938 30

REST-PAUSES AND REFRESHMENTS IN INDUSTRY

INTRODUCTION

THIS Report presents the results of an inquiry undertaken during November and December, 1938, by the National Institute of Industrial Psychology into the arrangements made in factories in this country for rest-pauses during working hours.

Rest-pauses are intervals in the working spell which the employee spends in resting or in some non-occupational activity. They are distinct from customary meal-times, but may be used partly for the consumption of refreshments. Rest-pauses in some form are normally taken by employees, and it is therefore their form, rather than their existence, which merits the consideration of those interested in the health of the employee or the efficiency of production.

Rest-pauses are, traditionally, periods of rest spontaneously taken by the employee when he feels the need of it. Many employers, however, have found such voluntary rests unsatisfactory, and, where practicable, have co-operated with their employees in organizing official rest-pause arrangements.

The demands of competitive enterprise and the widespread development of highly mechanized production affect the attitude of both employers and employees to rest-pauses. It is necessary for the employer to ensure that sufficient rest will be taken during working hours to achieve optimum productive efficiency, and it is in the interest both of employer and of employees to ensure that the health and general welfare of the latter are fully maintained in spite of the demands of production. This report will give some indication of how these two attitudes may be reconciled in practice.

I. OBJECT OF THE INQUIRY

The interest of the Institute in the problem of industrial fatigue is well-known. Through its industrial investigations and educational work, it has done much to encourage the introduction of organized systems of rest-pauses, as a method of reducing fatigue. The object of the present inquiry, however, has not been to influence employers on the subject of rest-pauses, and any general advice given in this Report is to be regarded as incidental. Nor has it been, as some employers have imagined, an investigation into the observance of the 1937 Factories Act which has had a considerable influence on the introduction of rest-pauses. Its

object has been simply to record the facts of existing practice, and to discuss the views expressed by the individuals who have contributed.

2. METHOD

The results presented in this Report are based upon information received from 1,050 factories situated in seven areas in Great Britain. These factories were selected at random, no attempt being made to obtain information from prescribed numbers of factories of specific size, or in specific industries. A wide variety of industries was investigated, the most important exclusions being such non-factory industries as Mining, Building, Transport and Shipbuilding. The results given in this Report do not include office employees.

Equal numbers (150) of factories were covered in and around the following towns: London, Cardiff, Birmingham, Manchester, Leeds, Newcastle-upon-Tyne, Glasgow.

Of the 1,050 factories, 575 employed less than 100 employees, 340 employed between 100 and 499, and 135 employed 500 or over. The approximate total number of employees to which these results refer was 305,000, comprising 183,000 males and 122,000 females. The average size of factory therefore was one employing 290 people, the sizes ranging from factories employing 5 to those employing over 12,000 people.

The information was obtained by personal interviews with such representatives of the management of the factories visited as Proprietor, Managing Director, Secretary, Works Manager, Labour Manager. The Institute's investigators discussed rest-pause arrangements with these individuals and recorded their information upon a standardized form.

As the results presented in this Report are based upon information received from a comparatively small group of factories, they may be taken as representative of all factories in the areas covered only after consideration of the errors which occur in the results of a sample inquiry.

In some tables, results have been analysed according to size of factory and geographical area. Before drawing any conclusions regarding size and area differences, readers are advised to consider the statistical factors involved. The matter is discussed more fully in Appendix II.

This inquiry could not have been carried out without the most cordial co-operation of many individuals throughout the country. The Institute greatly appreciates the courtesy with which they have received its investigators, and the readiness with which they have given information.

I. REST-PAUSES

1. PREVALENCE OF REST-PAUSES

For the purposes of comparison rest-pauses have been divided into the following four types:

1. Official (simultaneous).—Rest-pauses during which all or the great majority of employees in the factory stop work at the same time, *e.g.* from 10 to 10.10 a.m.

2. Official (rota).—Rest-pauses which are taken in rotation, where individuals or groups stop work for specified periods at various times, *e.g.* for ten minutes between 10 and 11 a.m.

The above types, when combined, may be referred to as 'organized rest-pauses.'

3. Official (own time).—Rest-pauses officially sanctioned by the management where the time of stoppage is selected by the employee.

4. Unofficial (own time).—Rest-pauses, not officially sanctioned by the management, but which, owing to tradition, the nature of the processes or indulgent supervision, are taken at the discretion of the employee.

'None' refers to factories where the 'respondent'* stated that no rest-pauses of any description were taken.

This apparently clear-cut classification of rest-pauses suggests a rigidity which does not exist in practice. Certain marginal cases may be allocated to more than one class. This is especially true when considering the classes 'unofficial' and 'none' since some form of rest-pause is normally taken by every individual during the working spell. 'Unofficial' pauses, again, may be so well established by tradition that they may almost be referred to as 'official.' The descriptions used in our classification are therefore not mutually independent but represent a gradual development in the organization of rest-pauses according to the degree of managerial control present. 'Unofficial' pauses imply no such control while a rota system may require a very high degree. Breakfast breaks, normal meal-times and tea breaks are not regarded in this Report as rest-pauses.

Table I shows the prevalence of the various types of rest-pauses in factories in all areas covered, and according to size of factory.

---

* This more general term is frequently used, as the individual interviewed could not always be described as the employer.

TABLE I

PREVALENCE OF REST-PAUSES
(In percentages)

Type of Rest-Pause	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
I. OFFICIAL											
i. Organized (morning and afternoon)	24.7	21.6	27.4	31.9	55.3	15.3	37.4	30.0	9.3	16.0	10.0
ii. Organized (morning only)	18.2	17.7	19.7	16.4	12.7	24.7	17.3	27.3	12.0	5.3	28.0
iii. Organized (afternoon only)	2.2	2.6	2.1	0.7	2.7	2.0	2.7	2.0	0.7	4.7	0.7
iv. Own time (morning and/or afternoon)	7.8	8.1	8.5	4.4	6.6	8.0	16.0	8.0	9.3	4.0	2.7
II. UNOFFICIAL	14.7	16.4	12.1	14.1	7.3	11.3	11.3	16.0	14.7	18.7	23.3
III. NO REST-PAUSES	32.4	33.6	30.2	32.5	15.4	38.7	15.3	16.7	54.0	51.3	35.3
Percentage Base (all factories visited)	1050	575	340	135	150	150	150	150	150	150	150

TABLE I

SUMMARY

Type of Rest-Pause	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
Official	52.9	50.0	57.7	53.4	77.3	50.0	73.4	67.3	31.3	30.0	41.4
Unofficial or None	47.1	50.0	42.3	46.6	22.7	50.0	26.6	32.7	68.7	70.0	58.6
Percentage Base (all factories visited)	1050	575	340	135	150	150	150	150	150	150	150

In Table I, factories having 'organized rest-pauses' in the morning or afternoon only, may have 'official (own time),' 'unofficial' or no rest-pauses during the other shift. 'Official (own time)' rest-pauses refers to factories having that type at least once per day. It does not include any factories with organized, but may include those having unofficial, rest-pauses at other times. It is assumed that factories having unofficial rest-pauses have them both morning and afternoon.

More than one rest-pause system may operate in the same factory. There are usually some employees whose work makes it difficult or unnecessary for them to observe the same rest-pause arrangements as others. Maintenance or warehouse staff, for example, may have different arrangements from production staff. Male employees may have different arrangements from female.

The arrangements existing for the majority of employees in any one factory have been regarded as the criterion in compiling Table I. In most cases, this majority was substantial, but in 21 factories (2 per cent.) two groups of employees of approximately equal size had different arrangements. In 18 of these factories one group had official rest-pauses, while the other had unofficial or no rest-pauses. These factories have been regarded as having official rest-pauses and have been recorded according to the type in operation. In 3 factories the types of official rest-pause, *i.e.* organized, and official (own time), were in operation for equivalent proportions of employees. These have been recorded as organized rest-pauses.

Table I Summary shows considerable variation in area percentages, and for that reason, it is more important to consider the area differences than the total percentage for the combined areas. The London, Birmingham and Manchester percentages for official rest-pauses show no significant differences from each other,* but all these percentages are significantly higher than those for Cardiff, Leeds, Newcastle and Glasgow. The differences within this latter group are as follows:

Cardiff and Leeds, Newcastle	Significant
Cardiff and Glasgow	Not significant
Glasgow and Leeds, Newcastle	Not significant
Leeds and Newcastle	Not significant

The London area is notable for the number of factories which make provision for organized rest-pauses both morning and afternoon (55.3 per cent., as compared with 24.7 per cent., the average for all areas).

* For criterion of significance, see Appendix II, pp. 50-52.

Cardiff, Manchester and Glasgow have considerable proportions of factories where organized rest-pauses are in operation only in the morning shift. The number of factories, in general, having organized rest-pauses only in the afternoon shift is very small. The tendency to have these rest-pauses more usually in the morning than in the afternoon is due, as will be seen later in this Report, partly to the need for food in the morning and partly to the longer morning shift.

In interpreting these figures of area differences, it is important to recognize that the prevalence of official rest-pauses is not wholly dependent upon managerial policy. It is influenced by a variety of factors, the most important of which are the general type of industry carried out in the area, the hours of work, the average size of factories, the proportion of male and female employees (dependent, to some extent, upon the general type of industry) and such intangible factors as local character and tradition.

Cardiff, Glasgow and Newcastle employ a high proportion of male labour, and the prevalence of industries employing large proportions of men indicates heavy, skilled or unstandardized work which is unsuitable for the operation of organized rest-pauses. In Glasgow, for example, a comparatively high percentage (23.3 per cent.) of factories have unofficial pauses.

In Cardiff, Leeds and, to a lesser degree, Newcastle, the apparent lack of rest-pauses is explained by the existence of breakfast breaks, lasting usually 30 minutes, which are not recorded in Table 1. A high proportion of the factories visited in these areas start work at 7.30 a.m. or earlier. The approximate proportions are:—

Leeds	45 per cent.
Cardiff	35 „
Newcastle	31 „

The percentage in all other areas is 8 per cent. or less.

Where factories start at 7 a.m. or earlier, a breakfast break almost invariably follows at about 8 a.m. or 8.30 a.m., and where they start at 7.30 a.m., a breakfast break may follow. In Leeds and Cardiff, 7 a.m. is quite a common time of starting work, and 26 and 17 per cent. respectively of factories visited in these areas have breakfast breaks.

In Newcastle, most of the factories forming the percentage quoted above (31 per cent.) start at 7.30 a.m. rather than 7 a.m. or earlier. Consequently breakfast breaks are not so common (4 per cent.). Those factories in Newcastle which do start at 7.30 a.m. appear, usually, to be

engaged upon heavy work, unsuitable for organized rest-pauses, and the employees (men) work through without official breaks until 12 noon or 12.30 p.m.

Special shift arrangements such as 2- and 3-shift systems are included in Table I, but it is unusual in these conditions to find genuine rest-pauses of the types with which this Report is concerned.

2. ROTA SYSTEMS

For purposes of general comparison we have combined in Table 1 'official (simultaneous)' and 'official (rota)' rest-pauses. We show in Table 2 the distribution of these two types in factories having organized rest-pauses.

TABLE 2

COMPARISON OF ORGANIZED SYSTEMS OF REST-PAUSES

Types of Organized Rest-pauses	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
Simultaneous	80.0	90.9	70.6	63.6	84.1	77.7	87.2	73.1	81.8	71.8	81.0
Rota	19.2	8.7	28.8	33.4	15.0	22.3	12.8	23.6	18.2	28.2	19.0
Both Types	0.8	0.4	0.6	3.0	0.9	—	—	3.3	—	—	—
Percentage Base (factories having organized rest-pauses)	474	241	167	66	107	63	86	89	35	39	58

The main conclusion to be drawn from this table is the tendency for rota systems to operate relatively more frequently in the large-sized factories which have greater staffs, more flexible staff arrangements, and a higher degree of general organization.

A rota system usually exists either because it is impossible or undesirable to stop machinery, or because it allows more orderly catering of refreshments. It involves either a slowing down of machinery so that a reduced staff is temporarily employed, or a transference of employees from one section to another to ensure the continuity of processes. A satisfactory rota system requires very careful planning and management.

3. DURATION AND INCIDENCE OF ORGANIZED REST-PAUSES

Table 3 (i), (ii) and (iii) and Table 4 (i), (ii) and (iii) show the most frequent durations, both absolutely (3 (i), 4 (i)), and relatively to length of shift (3 (ii), 4 (ii)), and the points of incidence after the beginning of the shift in both morning and afternoon shifts of organized rest-pauses. The point of incidence of rota rest-pauses has been taken as the mid-point of the total duration; if, for example, the rota continued from 10 to 11 a.m. the point of incidence would be regarded as 10.30 a.m.

In both morning and afternoon shifts, 10 minutes is the most frequent duration, although a 15-minute break is quite common. The figures in Tables 3 (i), 4 (i) should be compared with those in Table 3 (ii) and 4 (ii) which show the relation of duration of rest-pause to duration of shift. 10 minutes in a shift of 4½ hours or 5 hours is the most frequent arrangement in morning shifts, while 10 or, less commonly, 15 minutes in 4 hours is the most frequent in afternoon shifts. Two hours after the beginning of the shift is in both cases the most popular point of incidence.

In a small number of cases, more than one rest-pause was in operation in a shift. Conveyor workers, for example, may have five minutes per hour.

It is important to emphasize that, while the figures in Tables 3 and 4 indicate general practice, they do not establish standards. For such information, readers are referred to the numerous publications of the Industrial Health (formerly Fatigue) Research Board and of the Institute, which have frequently demonstrated that the optimum duration and incidence of rest-pauses can be determined only by experiment, and by a study of the work curve, where that is possible.

The most effective minutes of a rest-pause, for example, are those which immediately follow the cessation of work, and the value of a rest-pause is therefore not directly related to its length. Experience alone will show which is the most satisfactory length in specific conditions.

In general, when a single rest-pause is given in a shift it should normally occur about the middle of the shift, but the figures shown in Tables 3 (iii) and 4 (iii) show a considerable range from 1½ to 3 hours after the beginning of the shift.

Rest-pauses may, however, be influenced in duration and incidence by such factors as the provision of some kind of refreshment, which appears to be a widespread practice.

TABLE 3 (i)

DURATION OF ORGANIZED REST-PAUSES—MORNING

(In percentages)

Duration	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
10 minutes	56.3	50.1	59.4	71.0	53.0	56.1	55.0	53.4	63.7	71.0	57.7
15 „	36.9	43.2	33.9	21.0	37.3	40.4	38.8	40.9	30.3	25.8	34.6
5 „	4.0	4.0	3.8	4.8	4.9	—	5.0	3.4	6.0	—	5.8
20 „	1.4	1.8	1.0	1.6	2.9	—	—	2.3	—	—	1.9
Others	1.4	0.9	1.9	1.6	1.9	3.5	1.2	—	—	3.2	—
Percentage Base (total items)	445	224	159	62	104	57	80	88	33	31	52

TABLE 3 (ii)

RELATION OF DURATION OF ORGANIZED REST-PAUSES TO LENGTH OF SHIFT—MORNING

(In percentages)

Rest-pause	*Shift*	*All Areas*	*No. of Employees*			*Areas*						
			—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
10 mins.	4½ hrs.	24.3	20.9	26.8	30.7	13.7	28.3	21.9	30.2	36.4	20.0	29.4
10 „	5 „	21.4	18.3	22.3	30.7	29.4	18.4	30.5	14.0	15.1	20.0	11.8
15 „	5 „	14.9	17.8	12.8	9.7	22.6	23.3	19.5	7.0	6.1	6.7	5.9
15 „	4½ „	13.3	15.1	12.1	9.7	6.9	13.3	12.2	22.1	18.2	6.7	13.7
10 „	4 „	5.9	6.7	5.1	4.8	5.9	5.0	—	2.3	12.1	26.6	5.9
15 „	5 „	4.5	6.7	2.6	1.6	5.9	1.7	2.4	3.5	3.0	10.0	7.8
Others		15.7	14.5	18.3	12.8	15.6	10.0	13.5	20.9	9.1	10.0	25.5
Percentage Base (total items)		444	225	157	62	102	60	82	86	33	30	51

TABLE 3 (iii)

INCIDENCE OF ORGANIZED REST-PAUSES—MORNING

(In percentages)

Time after beginning of Shift		*All Areas*	*No. of Employees*			*Areas*						
			—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
Hrs.	Mins.											
2	00	30.9	32.6	32.0	20.9	36.2	22.8	41.2	17.2	30.3	29.0	38.6
2	30	15.3	16.5	12.3	19.4	12.8	31.6	17.5	10.2	18.2	12.9	7.7
1	30	10.8	12.9	8.2	9.7	8.8	14.0	13.8	12.5	9.1	3.2	7.7
1	45	8.1	8.9	8.9	3.2	9.8	5.3	5.0	13.6	6.1	3.2	7.7
2	15	6.1	4.5	6.3	11.3	6.9	5.3	5.0	4.5	6.1	6.5	9.6
1	50	6.1	3.6	6.3	14.5	5.9	—	5.0	12.5	9.1	3.2	3.8
3	00	5.4	5.4	7.6	—	3.9	12.3	3.8	2.3	15.0	9.7	—
2	20	2.9	2.7	1.3	8.1	5.9	—	—	4.5	—	3.2	3.8
2	05	2.7	2.2	3.2	3.2	1.0	—	2.5	4.5	—	—	9.6
Others		11.7	10.7	13.9	9.7	8.8	8.7	6.2	18.2	6.1	29.1	11.5
Percentage Base (total items)		444	224	158	62	102	57	80	88	33	31	52

TABLE 4 (i)

DURATION OF ORGANIZED REST-PAUSES—AFTERNOON

(In percentages)

Duration	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
10 minutes	53.8	47.2	55.6	72.0	49.4	52.2	53.2	55.6	52.7	61.2	62.7
15 „	37.6	43.8	36.7	18.6	34.6	47.8	40.6	37.8	42.1	32.3	31.1
5 „	5.0	5.5	4.4	4.7	8.6	—	6.2	4.4	5.2	—	—
20 „	1.8	1.4	1.1	4.7	4.9	—	—	2.2	—	—	—
Others	1.8	2.1	2.2	—	2.5	—	—	—	—	6.5	6.2
Percentage Base (total items)	279	146	90	43	81	23	64	45	19	31	16

TABLE 4 (ii)

RELATION OF DURATION OF ORGANIZED REST-PAUSES TO LENGTH OF SHIFT—AFTERNOON

(In percentages)

Rest-pause	*Shift*	*All Areas*	*No. of Employees*			*Areas*						
			—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
10 mins.	4 hrs.	27.1	23.6	26.4	40.5	22.7	16.7	35.0	26.6	13.3	33.4	40.0
15 „	4 „	13.5	18.5	8.8	7.1	13.1	12.5	16.7	8.9	26.8	10.0	13.3
10 „	4½ „	12.1	10.0	16.5	9.5	14.3	4.1	5.0	15.6	13.3	23.3	6.7
15 „	4½ „	9.5	10.7	9.0	4.8	11.9	8.3	8.3	6.7	20.0	6.7	6.7
10 „	3½ „	7.7	8.6	6.6	7.1	7.1	25.0	8.3	2.2	13.3	3.3	—
15 „	3½ „	5.9	7.1	4.4	4.8	4.8	16.7	5.0	6.7	—	3.3	6.7
Others		24.2	21.5	27.4	26.2	26.1	16.7	21.7	33.3	13.3	20.0	26.6
Percentage Base (total items)		273	140	91	42	84	24	60	45	15	30	15

TABLE 4 (iii)

INCIDENCE OF ORGANIZED REST-PAUSES—AFTERNOON

(In percentages)

Time after beginning of Shift	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
Hrs. Mins.											
2 00	34.1	41.1	25.2	29.7	28.6	26.1	37.1	37.9	31.5	32.3	56.4
2 30	21.3	20.6	26.4	13.6	23.7	8.7	29.1	17.8	21.1	19.4	12.5
1 45	8.3	7.2	6.6	15.9	12.5	17.4	4.8	4.4	5.3	6.5	6.2
1 30	7.6	7.8	7.7	6.8	11.3	21.7	6.5	2.2	—	3.2	6.2
2 15	4.0	3.5	4.4	4.5	6.3	—	3.2	6.7	—	3.2	—
3 00	3.6	2.8	3.3	6.8	3.8	4.4	—	2.2	21.1	3.2	—
2 45	3.6	5.0	2.2	2.3	1.3	13.0	3.2	2.2	10.5	3.2	—
2 20	3.6	2.1	4.4	6.8	2.5	—	1.6	13.3	—	—	6.2
Others	13.9	9.9	19.8	13.6	10.0	8.7	14.5	13.3	10.5	29.0	12.5
Percentage Base (total items)	276	141	91	44	80	23	62	45	19	31	16

4. WHERE AND HOW OFFICIAL REST-PAUSES ARE SPENT

Table 5 shows where official rest-pauses are normally spent. In many factories, some employees may spend their rest-pauses in one place, and some in another. This may be due to such factors as the nature of the work or the personal inclinations of the employee. Table 5 shows the usual possible combinations. To obtain a percentage of all factories where employees may spend their rest-pauses in the workroom it is necessary to add items 1, 2, 3 and 4; and of all factories where employees may spend them in the canteen, items 3, 4, 5 and 6 should be added.

TABLE 5

WHERE OFFICIAL REST-PAUSES ARE SPENT

(In percentages)

Where spent	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
1. Workroom	61.5	69.5	54.1	50.0	53.1	64.0	76.0	65.0	47.8	48.9	62.9
2. Workroom or outside	2.2	2.5	2.1	1.4	3.6	2.7	0.9	1.0	2.2	6.7	—
3. Workroom or canteen	9.0	5.3	11.3	17.2	15.3	1.3	9.2	7.0	15.2	6.7	6.5
4. Workroom, canteen or outside	2.9	2.5	2.1	7.2	6.3	—	1.9	4.0	—	4.4	1.6
5. Canteen	20.2	16.3	25.2	21.4	14.5	26.7	10.2	20.0	28.3	28.9	27.4
6. Canteen or outside	2.0	1.4	3.1	1.4	5.4	—	0.9	3.0	—	2.2	—
7. Outside	2.2	2.5	2.1	1.4	1.8	5.3	0.9	—	6.5	2.2	1.6
Percentage Base (factories having official rest-pauses which gave information)	547	282	195	70	111	75	108	100	46	45	62

The outstanding feature of this table is the high percentage of those who spend their rest-pauses in the workroom. Although many of the advantages of rest-pauses are to be gained even if employees remain in their workroom, they should preferably leave it to obtain the benefit of a short change of environment, involving, frequently, a change in the type of their muscular activity. As rest-pauses are so frequently associated with refreshments, the most suitable place would appear to be the canteen. Not only does this give the employee a change, but it also prevents spoilage of materials, the creation of refuse and the encouragement of vermin in the workroom. It is recognized, however, that owing to lack of accommodation or of general demand, many firms do not possess a

TABLE 6

HOW OFFICIAL REST-PAUSES ARE SPENT

(In percentages)

How spent	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
1. Eating	78.0	81.8	72.8	77.7	62.1	92.1	92.7	75.0	72.4	51.1	93.6
2. Eating or Exercise	0.9	0.7	1.5	—	0.9	1.3	0.9	1.0	2.1	—	—
3. Eating or Rest	16.1	12.5	21.1	16.7	30.7	5.3	4.6	19.0	23.4	28.9	3.2
4. Eating, Rest or Exercise	2.2	2.5	1.5	2.8	3.6	—	0.9	4.0	—	6.7	—
5. Rest	2.6	2.1	3.1	2.8	1.8	1.3	0.9	1.0	2.1	13.3	3.2
6. Rest or Exercise	0.2	0.4	—	—	0.9	—	—	—	—	—	—
Percentage Base (factories having official rest-pauses which gave information)	548	281	195	72	111	75	108	100	47	45	62

canteen, or at least a canteen large enough to hold all the workers taking a rest-pause at one time. Where only a small canteen is available some form of rota system is advantageous. Employees who spend their rest-pauses outside may do so for purposes of exercise (spontaneous or organized), smoking, or the purchase of refreshment from outside caterers. Organized exercise ('physical jerks', netball, etc.), while a notable feature of some large organizations, was insignificantly represented in this inquiry. In practically all instances recorded, rest-pauses were spent mainly in having refreshments. The proportion spending them entirely in relaxation was insignificant. Details are shown in Table 6 (where qualifications, similar to those in Table 5, apply).

II. REFRESHMENTS

I. PREVALENCE OF REFRESHMENTS

We have seen that in practically all cases employees spend their rest-pauses in taking refreshments. To indicate this relationship more explicitly, the refreshment arrangements of factories are analysed according to type of rest-pause in operation, and these details are shown in Table 7.

TABLE 7

REFRESHMENT ARRANGEMENTS IN FACTORIES

(In percentages)

Refreshment Arrangements	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
I. REFRESHMENTS											
1. Where official rest-pauses	51.6	49.0	55.8	51.1	76.0	49.3	71.4	66.0	31.3	27.3	39.4
2. Where unofficial rest-pauses	10.8	11.5	9.7	11.1	7.3	8.0	11.3	12.7	14.7	10.7	11.3
3. Where no rest-pauses	7.8	6.6	10.0	7.4	6.0	0.7	7.3	6.7	9.3	19.3	5.3
II. NO REFRESHMENTS											
1. Where official rest-pauses	1.4	1.0	1.8	2.2	1.3	0.7	2.0	1.3	—	2.7	2.0
2. Where unofficial rest-pauses	3.8	4.9	2.4	3.0	—	3.3	—	3.3	—	8.0	12.0
3. Where no rest-pauses	24.6	27.0	20.3	25.2	9.4	38.0	8.0	10.0	44.7	32.0	30.0
Percentage Base (all factories visited)	1050	575	340	135	150	150	150	150	150	150	150

It will be seen that many factories have refreshments without official rest-pauses (18.6 per cent.). Whereas 52.9 per cent. of all the factories have official rest-pauses, 70.2 per cent. have refreshments. If we include factories where it was stated that unofficial rest-pauses were in operation,

TABLE 7

SUMMARY

Refreshment Arrangements	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
I. Factories having refreshments	70.2	67.1	75.5	69.6	89.3	58.0	90.0	85.4	55.3	57.3	56.0
II. Factories having no refreshments	29.8	32.9	24.5	30.4	10.7	42.0	10.0	14.6	44.7	42.7	44.0
Percentage Base (all factories visited)	1050	575	340	135	150	150	150	150	150	150	150

the percentages of all rest-pauses is increased to 67.6, which may be taken as roughly similar to the total having refreshments. 7.8 per cent. stated that they had refreshments without rest-pauses, that is, while at work, and it is possible that a considerable proportion of those who stated that they had unofficial rest-pauses will have these pauses at times other than refreshment times. Where official rest-pauses are in operation, refreshments are almost invariably taken during the rest-pause; that is, refreshments are 'organized' during the rest-pauses. In some cases, however, refreshments may be 'organized' where no official rest-pauses are in operation, and may be served to employees while at work. But the organization of refreshments is capable of so many and such wide interpretations that it has not been considered worthy of investigation on its own merits. Further, the difficulties of dividing factories into those where refreshments are consumed and those where they are not are even greater than in the case of rest-pauses, because of the infinite variety of possibilities. The investigators have therefore depended upon the most usual customs rather than attempted to include every possible arrangement.

The insignificance of official rest-pauses without refreshments is indicated in Table 7, item II (1) (1.4 per cent.).

The prevalence of food and drink as part of the refreshment arrangements is shown in Table 8.

TABLE 8

FREQUENCY OF FOOD AND DRINK, IRRESPECTIVE OF REST-PAUSE ARRANGEMENTS

(In percentages)

Frequency of Refreshments	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
I. FREQUENCY OF FOOD COMBINED WITH DRINK											
1. Morning and afternoon	58.5	58.2	56.8	64.9	77.6	43.7	71.1	65.6	42.2	50.0	36.8
2. Morning only	20.3	19.8	21.4	19.1	10.5	36.8	11.1	28.9	16.9	11.6	33.4
3. Afternoon only	2.7	3.1	2.3	2.1	3.0	2.3	3.7	1.6	—	5.8	2.4
4. Neither	18.5	18.9	19.5	13.9	8.9	17.2	14.1	3.9	40.9	32.6	27.4
II. FOOD (WITH OR WITHOUT DRINK)											
1. Morning and afternoon	60.6	60.1	59.1	67.0	79.1	44.8	72.6	65.6	48.2	55.8	38.1
2. Morning only	21.1	20.7	21.4	21.3	11.2	36.8	11.1	29.7	16.9	12.8	35.7
3. Afternoon only	2.7	3.1	2.3	2.1	3.0	2.3	3.7	1.6	—	5.8	2.4
4. Neither	15.6	16.1	17.2	9.6	6.7	16.1	12.6	3.1	34.9	25.6	23.8
III. DRINK (WITH OR WITHOUT FOOD)											
1. Morning and afternoon	65.8	64.3	65.0	74.5	83.6	48.2	80.0	67.9	60.1	57.0	44.0
2. Morning only	27.8	28.8	30.0	18.1	11.2	47.1	13.3	29.7	30.2	30.2	50.0
3. Afternoon only	3.5	4.1	2.7	3.2	3.0	3.5	5.2	1.6	3.6	5.8	2.4
4. Neither	2.9	2.8	2.3	4.2	2.2	1.2	1.5	0.8	6.1	7.0	3.6
Percentage Bases (total factories having refreshments)	737	386	257	94	134	87	135	128	83	86	84

Of all those having refreshments, 81.5 per cent. have food and drink together, while 84.4 per cent. have solid food (with or without drink) and 97.1 per cent. have drink (with or without solid food).

The general conclusion of this table is that refreshments are more common in the morning than in the afternoon and that drink is consumed at least once during the day by a very high proportion of those who have refreshments.

TABLE 8

SUMMARY

Frequency of Refreshments	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
I. Food combined with Drink	81.5	81.1	80.5	86.1	91.1	82.8	85.9	96.1	59.1	67.4	72.6
II. Food (with or without Drink)	84.4	83.9	82.8	90.4	93.3	83.9	87.4	96.9	65.1	74.4	76.2
III. Drink (with or without Food)	97.1	97.2	97.7	95.8	97.8	98.8	98.5	99.2	93.9	93.0	96.4
Percentage Bases (total factories having refreshments)	737	386	257	94	134	87	135	128	83	86	84

2. NATURE AND POPULARITY OF REFRESHMENTS

To discover the most common types of refreshments and their relative popularity, respondents were asked to state what refreshments were usually consumed and to attempt to estimate their relative popularity among employees. Many respondents found some difficulty in discussing this question owing to ignorance of their employees' habits, but in most cases could give an opinion. Respondents were able to be more definite about drink than about food. The results in Tables 9 and 10 are based upon the numbers of factories where employees had food and drink, and where respondents were able to give information. Each item of food and drink is expressed as a percentage of this base. Thus (Table 9), in 79.0 per cent. of the relevant factories, bread was usually consumed, though it may have been accompanied by other forms of solid food, and in 21.0 per cent. of these factories, it was not usually consumed. In 44.9 per cent. it was stated that bread was the most popular type of food, and in 4.6 per cent. it was considered second in popularity to some other type. Where only one type of food or drink was mentioned, it has been regarded as a first preference.

No inquiry is necessary to discover that bread (and variations of bread, such as sandwiches) and tea are both the most common and most popular forms of food and drink. The actual figures, however, are

TABLE 9

CONSUMPTION AND POPULARITY OF VARIOUS TYPES OF SOLID FOOD (In percentages)

Type of Food	All Areas	Number of Employees			Areas						
		—99	100—499	500+	London	Cardiff	Birmingham	Manchester	Leeds	Newcastle	Glasgow
I. BREAD											
1. Consumed	79.0	76.3	79.8	86.1	76.0	57.1	91.7	92.8	76.0	62.5	84.0
(i) First place	44.9	47.3	39.9	48.1	46.5	35.7	58.0	33.0	40.8	41.1	58.0
(ii) Second place	4.6	3.6	4.8	7.6	9.8	1.4	1.9	2.1	1.9	10.7	4.0
(iii) Unplaced	29.5	25.4	35.1	30.4	19.7	20.0	31.8	57.7	33.3	10.7	22.0
2. Not consumed	21.0	23.7	20.2	13.9	24.0	42.9	8.3	7.2	24.0	37.5	16.0
II. CAKES											
1. Consumed	60.9	56.6	67.0	60.7	77.7	51.4	55.1	78.3	74.1	32.1	32.0
(i) First place	9.5	9.0	10.1	10.1	17.0	20.0	2.8	3.1	13.0	8.9	2.0
(ii) Second place	16.4	18.6	16.0	8.9	21.4	21.4	12.1	13.4	27.8	12.5	4.0
(iii) Unplaced	35.0	29.0	40.9	41.7	39.3	10.0	40.2	61.8	33.3	10.7	26.0
2. Not consumed	39.1	43.4	33.0	39.3	22.3	48.6	44.9	21.7	25.9	67.9	68.0
III. BISCUITS											
1. Consumed	58.6	56.3	62.2	58.2	61.6	70.0	43.0	68.0	53.7	64.3	50.0
(i) First place	13.2	15.8	11.2	8.9	4.5	37.2	5.6	4.1	13.0	32.1	12.0
(ii) Second place	8.4	9.0	6.9	10.1	8.0	8.6	7.5	8.2	—	14.3	14.0
(iii) Unplaced	37.0	31.5	44.1	39.2	49.1	24.2	29.9	55.7	40.7	17.9	24.0
2. Not consumed	41.4	43.7	37.8	41.8	38.4	30.0	57.0	32.0	46.3	35.7	50.0
IV. FRUIT											
1. Consumed	24.4	16.4	29.8	39.2	26.8	15.7	16.8	34.0	27.8	16.1	34.0
(i) First place	1.5	1.4	1.6	1.3	2.7	—	—	—	3.7	3.6	2.0
(ii) Second place	2.7	1.4	3.7	5.1	2.7	—	0.9	1.0	5.6	5.4	8.0
(iii) Unplaced	20.2	13.6	24.5	32.8	21.4	15.7	15.9	33.0	18.5	7.1	24.0
2. Not consumed	75.6	83.6	70.2	60.8	73.2	84.3	83.2	66.0	72.2	83.9	66.0
V. CONFECTIONERY											
1. Consumed	23.1	15.1	29.8	35.4	35.7	21.4	16.8	22.7	25.9	10.7	22.0
(i) First place	1.3	0.7	1.6	2.5	0.9	—	1.9	1.0	1.9	3.6	—
(ii) Second place	4.2	2.9	5.3	6.3	8.0	2.9	0.9	2.1	9.3	5.4	2.0
(iii) Unplaced	17.6	11.5	22.9	26.6	26.8	18.6	14.0	19.6	14.8	1.8	20.0
2. Not consumed	76.9	84.9	70.2	64.6	64.3	78.6	83.2	77.3	74.1	89.3	78.0
VI. OTHERS											
1. Consumed	8.8	4.0	11.2	20.2	13.4	4.3	10.3	6.2	7.4	8.9	8.0
(i) First place	1.5	1.1	1.6	2.5	3.6	—	—	1.0	1.9	1.8	2.0
(ii) Second place	0.7	0.4	1.6	—	2.7	—	0.9	—	—	—	—
(iii) Unplaced	6.6	2.5	8.0	17.7	7.1	4.3	9.4	5.2	5.6	7.1	6.0
2. Not consumed	91.2	96.0	88.8	79.8	86.6	95.7	89.7	93.8	92.6	91.1	92.0
Percentage Bases (total factories having food which gave information)	546	279	188	79	112	70	107	97	54	56	50

TABLE 10

CONSUMPTION AND POPULARITY OF VARIOUS TYPES OF DRINKS (In percentages)

Type of Drink	*All Areas*	*Number of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
I. TEA											
1. Consumed	89.6	89.4	88.6	93.0	97.6	93.0	96.9	95.1	72.4	68.4	90.6
(i) First place	78.6	82.6	72.0	79.2	88.9	83.6	82.1	83.7	61.9	57.0	81.1
(ii) Second place	2.6	1.9	3.0	4.6	7.1	7.0	2.3	0.8	2.6	3.8	—
(iii) Unplaced	8.4	4.9	13.6	9.2	1.6	2.4	12.5	10.6	7.9	7.6	9.5
2. Not consumed	10.4	10.6	11.4	7.0	2.4	7.0	3.1	4.9	27.6	31.6	9.4
II. MILK											
1. Consumed	42.4	29.8	53.8	64.3	46.9	25.6	41.4	43.0	54.0	48.2	36.6
(i) First place	10.7	7.6	15.2	11.5	7.2	10.4	5.5	2.4	26.3	26.6	6.8
(ii) Second place	20.1	14.4	23.4	35.6	29.4	9.3	15.6	27.6	15.8	16.5	20.3
(iii) Unplaced	11.6	7.8	15.2	17.2	10.3	5.8	20.3	13.0	11.9	5.1	9.5
2. Not consumed	57.6	70.2	46.2	35.7	53.1	74.4	58.6	57.0	46.0	51.8	63.4
III. COCOA											
1. Consumed	9.0	7.9	8.9	13.8	12.7	9.3	12.5	12.2	6.6	1.3	1.4
(i) First place	0.7	1.1	0.4	—	—	1.2	—	0.8	2.6	—	1.4
(ii) Second place	2.2	2.7	1.7	1.1	0.8	4.6	4.7	1.6	2.6	—	—
(iii) Unplaced	6.1	4.1	6.8	12.7	11.9	3.5	7.8	9.8	1.3	1.3	—
2. Not consumed	91.0	92.1	91.1	86.2	87.3	90.7	87.5	87.8	93.4	98.7	98.6
IV. COFFEE											
1. Consumed	8.2	4.3	10.6	18.4	11.9	9.3	10.9	7.3	5.3	5.1	4.1
(i) First place	0.3	0.3	0.4	—	—	1.2	—	—	—	1.3	—
(ii) Second place	1.7	1.1	1.7	4.6	4.8	1.2	2.3	0.8	—	—	1.4
(iii) Unplaced	6.2	2.9	8.5	13.8	7.1	7.0	8.6	6.5	5.3	3.8	2.7
2. Not consumed	91.8	95.7	89.4	81.6	88.1	90.7	89.1	92.7	94.7	94.9	95.9
V. BEER											
1. Consumed	1.6	0.8	3.0	1.1	0.8	2.4	3.9	—	—	3.8	—
(i) First place	0.3	0.5	—	—	—	1.2	—	—	—	1.3	—
(ii) Second place	0.6	0.3	0.9	1.1	0.8	—	1.6	—	—	1.3	—
(iii) Unplaced	0.7	—	2.1	—	—	1.2	2.3	—	—	1.3	—
2. Not consumed	98.4	99.2	97.0	98.9	99.2	97.6	96.1	100.0	100.0	96.2	100.0
VI. OTHERS											
1. Consumed	7.0	4.3	8.0	15.0	7.9	4.7	6.3	9.8	6.6	10.1	1.4
(i) First place	0.7	1.3	—	—	—	—	—	—	1.3	5.1	—
(ii) Second place	1.5	1.1	2.5	—	2.4	—	0.8	2.5	—	3.8	—
(iii) Unplaced	4.8	1.9	5.5	15.0	5.5	4.7	5.5	7.3	5.3	1.3	1.4
2. Not consumed	93.0	95.7	92.0	85.0	92.1	95.3	93.7	90.2	93.4	89.9	98.6
Percentage Bases (total factories having drinks which gave information)	692	369	236	87	126	86	128	123	76	79	74

interesting. There is less unanimity in the matter of food than in that of drink. Cakes and biscuits are equally powerful challengers to the popularity of bread. But tea occupies an outstanding position. This is due not only to its value as a stimulant, but also to its social and convivial associations, especially where women are concerned.

Tea is the most popular or only drink in 78.6 per cent. of these factories where drink is consumed, while it is in fact consumed in 89.6 per cent. of them. Milk is the most popular or only drink in 10.7 per cent. of these factories and is consumed in 42.4 per cent. of them. It is interesting to note that in 20.1 per cent. of these factories milk is ranked as a second favourite. The popularity of milk no doubt reflects the success of the recent propaganda campaign.

There were frequent instances during the inquiry of milk given to specific groups of people in factories to counteract the effects of their work, *e.g.* cellulose workers. While this milk is not compulsory, except for some very small groups of workers, its consumption appears to be generally prevalent.

3. SUPPLY AND PAYMENT

Table 11 (i) and (ii) shows the extent to which food and drink are supplied by employers and employees. Where refreshments are apparently supplied by 'Both', it indicates that some employees may bring their own while others are supplied by the employers; or that some employees may provide some of their food, and obtain the rest from their employers. It will be realized that the question of the supply of and payment for food is a complicated one and that various arrangements may exist at the same time, or at different times, in the same factory. In Table 11 (i) and (ii) the position has been simplified as far as possible, but to obtain a final figure of the percentages of employers and employees supplying and paying for refreshments, it is necessary to add 'Both' percentages to both parties. Thus, where food is consumed, 22.5 per cent. of employers and 88.5 per cent. of employees may supply some or all of it.

Adding, as before, the appropriate percentages, a greater percentage of employers supply drink than supply food (48.0 per cent. as compared with 22.2 per cent.). This is largely due to the practical difficulties of bringing drink to the factory as compared with food. There is also a tendency for food to be more frequently supplied by employers in the large factories, due to better catering arrangements.

TABLE 11 (i)

SUPPLY OF FOOD

(In percentages)

Provision of Food	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
1. By Employer	11.6	4.4	17.9	22.3	10.4	6.8	9.3	9.4	22.2	12.5	17.7
2. By Employees	77.8	90.9	64.6	62.4	71.2	90.5	74.6	80.4	72.2	78.1	82.3
3. By Both	10.6	4.7	17.5	15.3	18.4	2.7	16.1	10.2	5.6	9.4	—
Percentage Base (total having food who gave information)	613	316	212	85	125	73	118	117	54	64	62

TABLE 11 (ii)

SUPPLY OF DRINK

(In percentages)

Provision of Drink	*All Areas*	*No. of Employees*			*Areas*						
		—99	100—499	500+	*London*	*Cardiff*	*Birmingham*	*Manchester*	*Leeds*	*Newcastle*	*Glasgow*
1. By Employer	37.1	28.4	45.6	49.4	44.6	33.8	25.7	33.2	48.7	41.3	38.3
2. By Employees	52.0	64.4	41.0	31.5	40.7	62.7	52.4	58.3	43.3	50.0	59.2
3. By Both	10.9	7.2	13.4	19.1	14.7	3.5	21.9	8.5	8.0	8.7	2.5
Percentage Base (total having drink who gave information)	710	374	247	89	130	86	132	127	74	80	81

In considering Table 12 (i) and (ii), the item 'Both' represents cases where, for example, there may be favourable conditions for specific classes of workers such as juveniles or those connected with unpleasant or dangerous trades; or where some food, such as the products of the factory, is provided free.

TABLE 12 (i) and (ii)

PAYMENT FOR FOOD AND DRINK WHEN SUPPLIED BY EMPLOYER

(In percentages)*

FOOD *Paid for by*	*All Areas*	DRINK *Paid for by*	*All Areas*	*No. of Employees* —99	100—499	500+
1. Employer	15.5	1. Employer	37.6	60.4	22.2	22.7
2. Employees	66.2	2. Employees	53.3	33.0	66.3	68.2
3. Both	18.3	3. Both	9.1	6.6	11.5	9.1
Percentage Base (no. of Employers supplying food)	71	Percentage Base (no. of Employers supplying drink)	263	106	113	44

33.8 per cent. (15.5 per cent.+18.3 per cent.) of employers may pay for the food they supply, while 46.7 per cent. (37.6 per cent.+9.1 per cent.) may pay for drink. It is important to recognize, however, that in many cases where refreshments are provided by employees, a part of the cost is borne by employers. Where refreshments are sold to employees, they are almost invariably sold on very favourable terms, and even where employees provide their own refreshments, the employer may supply such requisites as hot water, heating facilities, accommodation, glass and crockery.

* Further analysis undesirable owing to smallness of percentage bases.

III. GROWTH OF OFFICIAL REST-PAUSES AND REFRESHMENTS

TABLE 13 shows the percentages of official rest-pauses and of refreshments at present in operation which were introduced before 1924 and in each year since that date.

TABLE 13

GROWTH OF (i) OFFICIAL REST-PAUSES
(ii) REFRESHMENTS
(In percentages)

Year of Introduction	*Official rest-pauses*				*Refreshments*			
	All Areas	*No. of Employees*			*All Areas*	*No. of Employees*		
		—99	100—499	500+		—99	100—499	500+
1938	10.6	8.5	11.7	15.4	7.9	6.1	7.5	14.8
1937	7.8	9.0	8.0	3.1	7.3	6.1	10.4	4.1
1936	4.5	5.1	3.7	4.6	7.1	6.9	8.6	4.1
1935	6.1	7.7	3.7	6.2	5.5	6.9	4.0	4.1
1934	4.5	4.7	4.9	3.1	4.7	6.5	3.4	1.3
1933	5.2	3.8	5.6	9.2	4.7	4.1	4.6	6.7
1932	4.1	3.8	5.6	1.5	3.5	4.1	4.0	—
1931	2.0	2.1	2.5	—	1.0	1.2	1.1	—
1930	5.0	6.0	4.3	3.1	4.2	5.7	2.9	2.7
1929	1.5	0.9	—	7.7	1.6	0.8	0.6	6.7
1928	5.2	4.7	6.2	4.6	5.1	4.5	4.6	8.1
1927	1.3	1.7	0.6	1.5	1.0	1.2	1.1	—
1926	2.2	2.6	1.8	1.5	2.0	1.6	2.3	2.7
1925	1.3	1.3	1.8	—	1.0	1.2	1.1	—
1924	0.7	—	1.2	1.5	0.8	0.4	1.7	—
Before 1924	38.0	38.1	38.4	37.0	42.6	42.7	42.1	44.7
Percentage Base (total items)	461	234	162	65	494	246	174	74

Thirty-eight per cent. of rest-pauses and 42.6 per cent. of refreshments were introduced before 1924; that is to say, 62 per cent. rest-pauses and 57.4 per cent. refreshments have been introduced since then. In recording the information contained in this table, reliance had generally to be placed upon the respondents' memories, and the common faults of memory occur in it. 1930, for example—a round number—and 1928—ten years ago—indicate an importance in relation to the

preceding and succeeding years, which is probably unjustified. Vague estimates have been excluded from these tables. The considerable increase in rest-pauses during 1938 is partly due to the introduction of new regulations in the Factories Act.

To reduce the effects of the abnormal items in Table 13, the increases in rest-pauses and refreshments have been charted in Diagram 1 in moving five-yearly totals. The proportions of rest-pauses and refreshments already in existence in 1924 (38 per cent. and 42.6 per cent.) have, however, been added as constants to each five-yearly total so that the relative growth of rest-pauses and refreshments may be shown.

Thus, the percentages for 1928 represent the cumulative totals for the years 1924 to 1928, plus the added constants. The figures for 1929 are obtained by adding the 1929 percentages to, and subtracting the 1924 percentages from, the total percentages for 1928; and the same device is used for succeeding years. The figures for each year, therefore, represent the percentages for that year and for the four preceding years, weighted according to the percentages of rest-pauses and refreshments in existence before 1924. In this way the general trend is more clearly indicated.

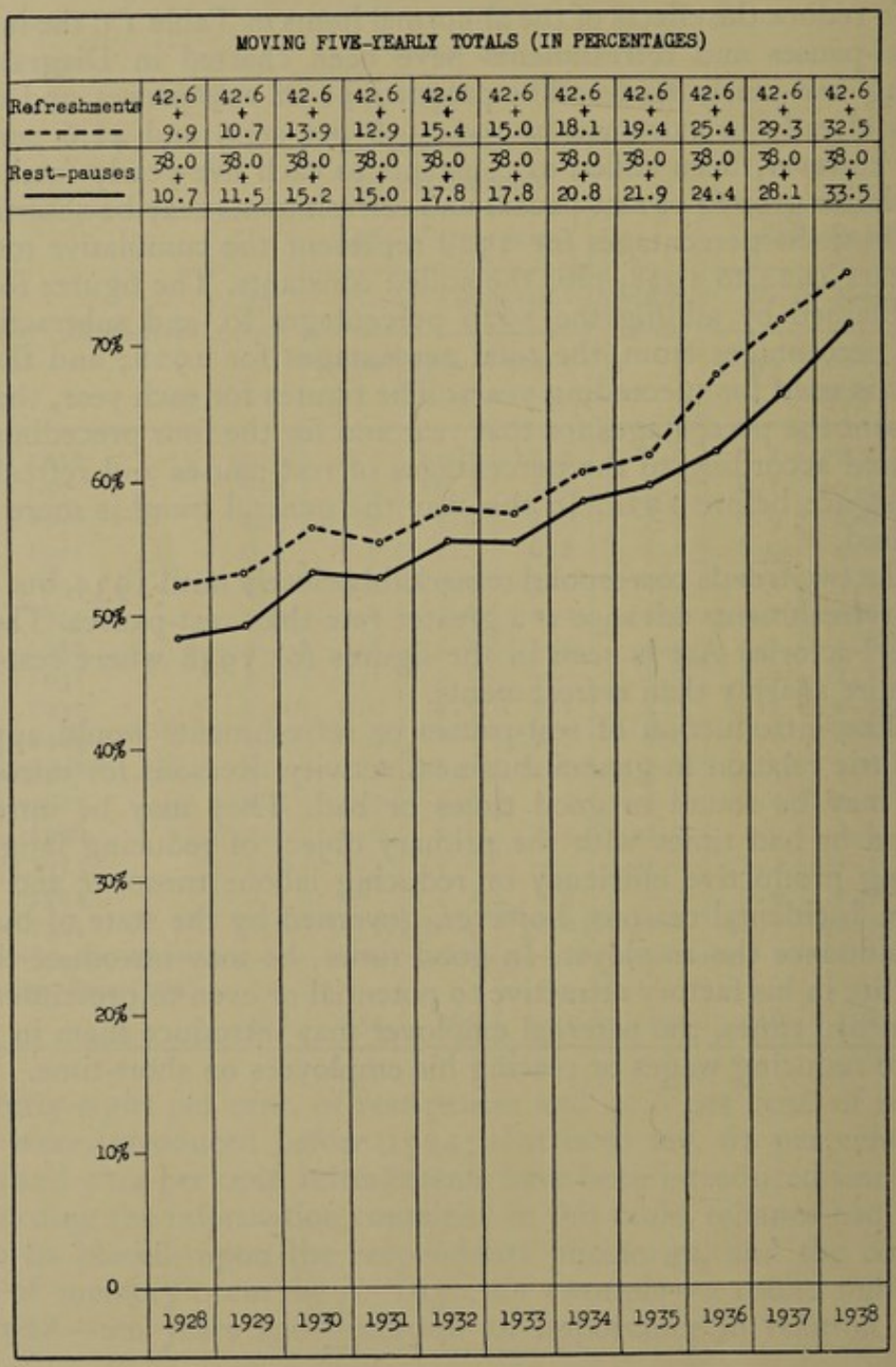
The two trends correspond remarkably closely until 1935, but during 1936 refreshments advance at a greater rate than rest-pauses. The effect of the Factories Act is seen in the figures for 1938 where rest-pauses rise more sharply than refreshments.

The introduction of rest-pauses or refreshments would appear to have little relation to general business activity. Reasons for introducing them may be found in good times or bad. They may be introduced in good or bad times with the primary object of reducing fatigue, increasing productive efficiency or reducing labour turnover and absenteeism. Incidental reasons, however, governed by the state of business, may influence the employer. In good times, he may introduce them to make life in his factory attractive to potential or even to present employees. In bad times, the paternal employer may introduce them in preference to reducing wages or placing his employees on short-time.

DIAGRAM 1

GROWTH OF OFFICIAL REST-PAUSES AND REFRESHMENTS. MOVING FIVE-YEARLY TOTALS 1928-1938. (ALL AREAS)

(Percentages)



IV. EMPLOYERS' ATTITUDES TO REST-PAUSES AND REFRESHMENTS

I. REASONS FOR INTRODUCTION

Rest-pauses have two primary and equally important objects—to reduce the immediate fatigue and nervous strain of the employee, and to increase productive efficiency, which may take the form of increased output or better quality. Other advantages are alluded to in the published literature on the subject, but these are incidental justifications. Yet it appears from the information obtained in this inquiry that comparatively few employers are influenced by these two primary objectives when introducing rest-pauses. The incidental considerations attain primary importance and rest-pauses are thrust upon the employer by the habits of his employees or by the pressure of outside influences.

Respondents were not specifically asked why rest-pauses were in operation in their factories, but a number of them volunteered the information which is shown in Table 14.

TABLE 14

REASONS FOR INTRODUCTION OF OFFICIAL REST-PAUSES

Reason	*Per cent.*
Opportunity for refreshment for those having inadequate breakfast	30.7
Factory Act requirements	29.3
To regularize unofficial pauses	18.7
Considered necessary for efficiency	4.0
To stop smoking in workroom	4.0
At employees' request	2.7
Out of consideration for workers	2.7
Refreshment time required by Trade Union	1.3
Recommended by I.H.R.B. investigation	1.3
Others	5.3
Percentage Base (total items)	75

It appears that rest-pauses are frequently introduced not to enable employees to rest, but to enable them to consume refreshments. This is especially applicable to factories employing large numbers of young girls. They rush to work without adequate breakfasts, in consequence of which, within about two hours, a decided flagging is noticed and cases of fainting may occur. Moreover, the afternoon's work is frequently

much better than the morning's. At the same time, it must be realized that no employee can work uninterruptedly for a spell of four or five hours without resting, and that an organized rest-pause is unquestionably preferable to unorganized rest voluntarily taken or unexpectedly enforced through waiting for material or inspection.

In actual practice the need for food is the chief complicating factor in determining the optimum point of incidence of rest-pauses since employees start hungry and become hungrier before their efficiency would usually be expected to decrease. Rest-pauses should operate to make work easier and not merely to make it possible. Where they satisfy only the second requirement, their fullest advantages will not be realized.

It is not altogether surprising that the secondary considerations influence employers most when contemplating the introduction of rest-pauses, for where normal efficiency is being maintained the employer, harassed by the rush and urgency of the production schedule, hesitates to interrupt his factory's routine and introduce rest-pauses with the specific hope of increasing efficiency. It is difficult for him to believe that by losing ten minutes' work he will more than make it up, as he must if his innovation is to be economic. In a spell of $4\frac{1}{2}$ hours—270 minutes—a loss of 10 minutes would superficially represent a loss in production of 3.7 per cent., where production is dependent mainly upon manual labour. It has, moreover, been demonstrated frequently* that the desirable effects of rest-pauses will not be seen immediately, and that a decrease in production may even follow until the workers adapt themselves to the new arrangements. Nevertheless, the effectiveness of rest-pauses has been so frequently proved both in this country and abroad that, where possible, their introduction merits the most serious consideration.

It will be observed that a number of respondents have stated that rest-pauses were introduced to regularize unofficial pauses. This has the advantage usually, not only of reducing the time lost by employees but also of enabling the employer to ensure that rests will be taken at the most effective times during the spells of work. It is of course quite common for employees to lose at least ten minutes' productive time in a shift where no rest-pauses are in operation. One of the objects of official rest-pauses is to reduce this loss.

Cf. Industrial Health Research Board, Annual Report, 1938, pp. 4–6. H.M. Stationery Office (1*s*.).

It is probable that the figure for those who state that the Factories Act is responsible for their rest-pauses is unduly high, owing to the fact that this reason was of great importance to those to whom it applied, and was therefore likely to be referred to specifically. As Table 13 shows, the Act was apparently responsible for a considerable increase in rest-pauses during 1938.

2. EFFECTS ON EFFICIENCY

Respondents were asked to state, in general terms, their opinion as to the effects of rest-pauses and refreshments on efficiency, and if possible to support their opinion with more definite evidence. The general opinions, shown in Table 15, indicate whether effects were good, bad or not noticeable. Replies are analysed according to the type of rest-pauses in operation. Where there are apparently no rest-pauses, it signifies that refreshments are consumed at work.

TABLE 15

EFFECTS ON EFFICIENCY, ETC., OF REST-PAUSES AND REFRESHMENTS

(In percentages)

Effects	*Type of Rest-pause*					
	Official (simultaneous)	*Official (rota)*	*Official (own time)*	*Unofficial (own time)*	*None (refreshments only)*	*All types*
1. Good	88.4	91.6	82.3	63.2	47.0	82.0
2. Bad	2.0	1.2	4.1	4.0	15.7	3.4
3. None	9.6	7.2	13.6	32.8	37.3	14.6
Percentage Base (total giving information)	357	84	73	76	51	641

This table demonstrates rather strikingly that organized rest-pauses are likely to be more satisfactory than unorganized. A rota system, which must usually be the most highly organized, is apparently the most frequently successful.

Table 16 is an analysis of the reasons why rest-pauses were favourably regarded by employers.

TABLE 16

REASONS FOR POPULARITY OF REST-PAUSES AMONG EMPLOYERS

(In percentages)

Reasons	*Per cent.*	
A. EFFECTS ON EFFICIENCY	41.6	
(1) Output increased		25.6
(2) Output maintained		7.1
(3) General health improved, energy renewed, etc.		7.1
(4) Less absenteeism		1.8
B. IMPROVEMENT IN MORALE—BETTER ATMOSPHERE, ETC.	13.3	
C. ADVANTAGES IN SPECIFIC CASES	11.6	
(1) Monotonous work		2.7
(2) Strenuous work		2.7
(3) For women		6.2
D. MISCELLANEOUS GENERALLY FAVOURABLE COMMENTS	33.5	
Percentage Base (total items)	113	

Few employers had attempted any measurement of the effects on efficiency of rest-pauses by using such criteria as output or health records, and results cannot easily be grouped. We consider, however, that the following specific comments are worthy of consideration.

1. "Figures comparing piece-workers' wages before and after rest-pauses were introduced showed an increase in two departments."

2. "Study of output in warehouse has shown an increase of 5 to 7 per cent. since rest-pauses were officially introduced; less time is wasted."

3. "Wages for piece-workers in 12 weeks after introduction of rest-pauses showed an increase on any 12 weeks before introduction of breaks."

4. "By drawing up statistics of bonus figures, falls and rises were

found to be intermittent after introducing rest-pauses, but production generally improved although rest-pauses were possibly only a contributory factor."

5. "Wages of piece-workers not lost by rest-pauses."

6. "On introduction of 10 minutes' break, Trade Union suggested workers would lose, and asked for adjustment of prices, but wages have increased."

7. "Output went up 13 per cent."

8. "Very good effect; greater output noticed."

9. "From efficiency records, it was shown that output had increased."

10. "Little absenteeism. 18 per cent. at one time."

11. "Actual gain in production after a rest-pause was introduced gauged at 5 per cent. Got the same production without overtime."

12. "At one time a 10-hour day with two rest-pauses of 10 minutes were introduced, with no change in output. Then a reduction of an hour in working time was introduced and rest-pauses taken off; no output change. Finally a 45-hour week was introduced with two 10-minute rest-pauses. Still no reduction in output. Rest-pauses are very helpful as regards efficiency."

13. "Fewer absentees and a more cheerful outlook was noted at first."

14. "Statistics of output kept. Output has been well maintained."

15. "Observed that production increased for at least an hour after the pause and refreshments."

16. "Production increased."

17. "Since 1937, records of output have been kept, and it is thought that the increase observed is at least partly due to the institution of an afternoon break, but the effects of the rest-pause are difficult to assess since other changes were made at the same time, viz. 45- instead of 48-hour week, and 5- instead of 5½-day week."

18. "Formerly, rest-pauses were taken in the employees' own time —a wasteful method. Now nine service stations each with a trolley and one or two girls arrive at nine points in the works with tea, sandwiches and cakes. All are served in 2-3 minutes, and trolleys are on their way back at once, leaving five minutes clear to eat and drink. The introduction of this organized break resulted in a 10 per cent. increase in the earnings of the piece-workers, while production of the works as a whole increased 17½ per cent., measured in Bedaux units."

19. "Introduced as a result of an Industrial Health Research Board investigation. Output showed an increase."

3. OBJECTIONS TO OFFICIAL REST-PAUSES

In Table 17 the reasons are shown why official rest-pauses are considered unsuitable. The great majority of answers to this question came from factories where rest-pauses had never existed, but a few are included where employers were dissatisfied with existing rest-pause arrangements, but considered it undesirable to abolish them.

The reasons given in this table do not necessarily represent attitudes unfavourable to rest-pauses. The largest single item, "Intermittent work allows occasional rests" implies that in some types of production, unofficial rests are, for various reasons, inevitable and these breaks are so well established that no advantages would be gained by making them official, or attempting to organize them. In this connection, the following quotation from the Industrial Fatigue (now Health) Research Board's Report No. 32* should be considered:—

"Irregularly recurring and unexpected stoppages usually tend to interfere with the rhythm and swing of work, and frequently occur when they are not wanted and least needed. They are often annoying interruptions to continued activity, and have a disturbing effect upon the attitude towards the task."

That report also refers to the benefits of "mass-suggestion" in the case of enforced (simultaneous) stoppages. In some factories the nature of production will make this point irrelevant, but in others it suggests that occasional stoppages may be reduced by more effective production control. It is interesting also to compare the conclusions of the Board with item A (3) in Table 17 where 7 per cent. of the replies indicate that unorganized rests achieve the same result as organized. The absence of rest-pauses because of "continuous processes" (7.7 per cent.) suggests the point of view of the machine rather than the human being. It is in such circumstances that a rota system is particularly useful.

---

* Industrial Fatigue Research Board, Report No. 32. (S. Wyatt & J. A. Fraser) 1925, p. 27 H.M. Stationery Office (*2s. 6d.*)

TABLE 17

REASONS FOR NON-EXISTENCE OF OFFICIAL REST-PAUSES

(In percentages)

Reasons	*Per cent.*		
A. UNNECESSARY	62.2		
(1) Nature of work		43.0	
(i) Intermittent work allows occasional rests			31.6
(ii) Work not strenuous			4.0
(iii) Short spells			3.7
(iv) Work not monotonous			3.7
(2) Governmental and Trade regulations do not require		1.7	
(3) Effects achieved by unofficial rests		7.0	
(4) Reasons unspecified		10.5	
B. UNDESIRABLE	17.2		
(1) Unsuitable for piece-workers		7.2	
(2) No demand from employees		3.0	
(3) Makes workers lazy, wastes time		3.0	
(4) Would reduce output		4.0	
C. IMPRACTICABLE	12.9		
(1) Continuous processes		7.7	
(2) Too costly, competition too keen		2.2	
(3) Reasons unspecified		3.0	
D. INCONVENIENT	4.1		
(1) Organization would be difficult		2.2	
(2) Too busy		0.7	
(3) Other reasons		1.2	
E. NEVER CONSIDERED	3.6		
Percentage Base (total items)		402	

4. REASONS FOR NON-EXISTENCE OF REFRESHMENTS

Table 18 shows the reasons given for the non-existence of refreshments.

TABLE 18

REASONS FOR NON-EXISTENCE OF REFRESHMENTS

Reasons	*Per cent.*		
A. UNNECESSARY	39.6		
(1) Short shifts, no need for food, etc.		37.3	
(2) Work not strenuous		2.3	
B. UNDESIRABLE	26.7		
(1) Unhygienic, create refuse, etc.		10.4	
(2) Abused by employees		2.3	
(3) Effects bad		11.7	
(i) Interrupt operative's continuity			4.7
(ii) Interrupt running of machinery			3.5
(iii) Generally disorganize			3.5
(4) Too expensive		2.3	
C. NOT WANTED BY EMPLOYEES	12.8		
D. IMPRACTICABLE	9.3		
(1) No rest-pauses		2.3	
(2) Rest-pauses too short		2.3	
(3) Organization difficult		4.7	
E. NOT CONSIDERED, NOT CUSTOMARY IN TRADE, ETC.	11.7		
Percentage Base (total items)		86	

37.3 per cent. of replies indicated that, as the shift hours were short, there was no need for additional food. This on the whole appears

a justifiable explanation, though it is possible that a refreshing drink might be advantageous. The hygienic difficulties of refreshments may certainly be considerable where no canteen is available; but it should be possible to reserve a section of the workroom for the consumption of refreshments. Where certain processes connected with food products or poisonous material are in operation, however, the consumption of refreshments in the workroom is impossible.

What has been already said (page 36) with regard to rest-pauses and continuous processes applies equally to refreshments; some form of rota is necessary. It has not usually been found in practice that a stop for refreshments will have bad effects on output by interrupting the operative's continuity. Indeed, it is found that operatives quickly resume and even surpass their previous standards.

5. REASONS FOR ABOLITION OF REST-PAUSES

An interesting class of factories consisted of those who had tried official rest-pauses but had abolished them. Table 19 shows the frequency of the reasons for abolition. As the total number here is small we give the raw figures.

TABLE 19

REASONS FOR ABOLITION OF REST-PAUSES

Reasons	*Nos.*
Rest-pauses abused	19
Working hours reduced	13
Disorganized later work	3
Rest-pauses not effective	3
Piece-workers disliked rest-pauses	2
Total	40

Rest-pauses will always provide a ready opportunity for abuse. The numbers in the above table emphasize that, to be successful, they must be accompanied by firm but reasonable discipline. Employees should not be allowed to prolong their rest unduly, but employers should realize that they cannot always be held rigidly to the recognized time, and that an additional minute or two may be difficult to avoid. This problem depends somewhat upon the general organization. Where refreshments are well-organized, and speedily supplied, employers can

demand a more rigid enforcement of the time limit. But where the opposite is the case, or where employees must walk some distance for refreshments, etc. this is more difficult.

Rest-pauses cannot simply be introduced and allowed to work out their own effects. The advantages of rest-pauses to both employer and employee will be obtained only if both realize that certain additional responsibilities are incurred. Where discipline is normally slack, it is enforced with greater difficulty in conjunction with rest-pauses.

The abolition of rest-pauses as a result of reduced hours of work suggests that their real advantages have not been fully achieved. If a reduction of hours of work must be accompanied by an abolition of rest-pauses, it indicates that efficiency is being lost rather than gained by rest-pauses. It was occasionally stated that employees preferred to leave earlier in the evening rather than have rest-pauses during the day. It should be emphasized, however, that the value of a rest-pause depends largely upon its introduction at the moment when efficiency is beginning to flag*, which is more likely to be in the middle than towards the end of the shift.

---

* *Cf.* Industrial Fatigue Research Board, Report No. 42 (S. Wyatt), 1927, p. 19. H.M. Stationery Office (9*d.*)

CONCLUSIONS

1. Although this inquiry has included many different types of industries, the prevalence of official rest-pauses is fairly high. London, Birmingham and Manchester are notably well-organized from this point of view and there are sound reasons for the lower standards of other areas.

2. A rest-pause of 10 minutes, taken 2 hours after the beginning of a $4\frac{1}{2}$-hour shift in the morning and of a 4-hour shift in the afternoon is the most frequent occurrence.

3. Rest-pauses are most commonly spent in the workroom and are almost invariably used for the consumption of refreshments.

4. Refreshments are consumed in considerably more factories than have official rest-pauses. Bread and tea are the most frequently consumed and also the most popular refreshments. Other cereal foods and milk have considerable popularity.

5. Employers more frequently supply, and pay for, drink than food.

6. Official rest-pauses and refreshments show an increasing trend which has been accentuated in recent years. During 1938, official rest-pauses increased considerably owing to the introduction of new regulations in the Factories Act.

7. Few employers introduce rest-pauses after scientific experiment. They are influenced mainly by secondary considerations, notably the need of food by young employees in the morning shift.

8. Rest-pauses and refreshments are generally admitted to have good effects on efficiency. The effects vary, on the whole, with the degree of organization of the rest-pause system.

9. The most common reason for the non-existence of official rest-pauses is that the nature of the productive process does not require them, and unofficial rests may be taken when desired or when possible.

10. Where no refreshments are consumed, it is usually maintained that the short hours of work do not require them.

11. Rest-pauses have been abolished in a few isolated cases; the principal reason given is abuse of the privilege by employees, though change in the hours of work is also a contributory factor.

It has been emphasized in this Report that rest-pauses must be regarded not in isolation but as a part of general policy. While the consumption of refreshments appears to be widely recognized as advantageous, organized rest-pauses, where the need for refreshments is not present, are not invariably essential. They are, indeed, only one method of combating fatigue and boredom. In some cases, instead of a complete cessation of work, a slowing down of activity (accompanied possibly by

a reduction of machine speed) a change of work, the provision of smaller or larger units of work, or the use of music may have equally beneficial results. The last three methods are especially useful for those employees who feel the effects of boredom.

The relative advantages of these various methods must be considered in the light of conditions existing in individual factories; the value of their experimental investigation can hardly be over-emphasized.

In the broad view, the object of management is to reduce the dangers of fatigue in every way possible. But before specific methods are introduced, every effort must be made to deal with the factors which induce fatigue. Such factors are posture, bench lay-out, shop lay-out, machine design, tool design, heating, ventilation, lighting, production control, incentives and supervision. The selection of the most suitable employee for the job may also be an important factor. When we have stated these factors, we have stated most of the important subjects of investigation in the field of industrial psychology.

Appendix I
MUSIC IN FACTORIES

I. PREVALENCE OF MUSIC

THE past few years have seen a marked increase in the use of music in factories. This is due partly to the activities of the producers of the necessary equipment and partly to the satisfactory effects of music which have been observed in one factory by the Industrial Health Research Board.*

Music may be used, either in conjunction with rest-pauses, or in place of them, as a relief to boredom, and it may also be used for general entertainment purposes at meal and other times. While this inquiry was concerned mainly with rest-pauses, the opportunity was taken of asking, in a number of cases, whether music was used in the respondent's factory, in any form, and what its effects were. Table 20 shows the prevalence of music on various occasions throughout the working day.

TABLE 20

PREVALENCE OF MUSIC

Prevalence	*Per cent.*
I. FACTORIES WITH MUSIC	10.7
(1) At work only	2.5
(2) At work and during meal-times	0.9
(3) At work and during rest-pauses	0.5
(4) At work, during rest-pauses and during meal-times	0.9
(5) During rest-pauses and during meal-times	0.6
(6) During rest-pauses only	0.8
(7) During meal-times only	4.5
II. FACTORIES WITHOUT MUSIC	89.3
Percentage Base (no. giving information)	970

4.8 per cent. (the sum of items I (1), (2), (3) and (4)) of the factories visited have music at work while 6.9 per cent. (the sum of items I (2), (4), (5) and (7)), have music during meal-times, though each group may have music at other times. Music at meal-times (in the canteen) is of course both more natural and more easily organized than in the workroom. Moreover it may be possible to enjoy music in the comparative quiet of the canteen when it is not possible in the workroom.

* Industrial Health Research Board, Report No. 77, (S. Wyatt & J. N. Langdon assisted by F. G. L. Stock) 1937, pp. 30-42. H.M. Stationery Office (1*s.* 3*d.*).

Music in industry to-day, however, is of chief interest when provided as an accompaniment to work. Rest-pauses provide one means of reducing fatigue and boredom; music offers possibilities of the alleviation of boredom at least. The relationship of official rest-pauses and music in the same factory is of considerable interest, but this inquiry has indicated such varied arrangements of rest-pauses and music that no general practice can be indicated. Of the 47 factories (4.8 per cent.) where music was provided at work, 32 also had rest-pauses in operation, while 15 had no rest-pauses. Where respondents were able to state the actual times during which music operated, the majority used it after a rest-pause. The length of time after the rest-pause, however, varied considerably, ranging from half an hour to two and a half hours. The need for refreshments during working hours is indicated by the fact that while only 32 factories had rest-pauses in addition to music at work, 43 had refreshments. Thus, although music may be theoretically regarded in some cases as a substitute for rest-pauses, the need for refreshments may modify the situation in practice. Since it is usually desirable that official rest-pauses should be arranged for the consumption of refreshments, it would appear that music should rather supplement than supplant rest-pauses with refreshments.

There was little unanimity regarding the duration of music at any time. Table 21 shows the frequency of various arrangements among those factories which provided music at work, whether or not official rest-pauses were in operation (actual numbers).

These factories usually had the same arrangements in morning and afternoon. The wide variations in the figures suggest that the times chosen are very much a matter of chance, due probably to the type of radio programme being broadcast, the requests of the workers, or the inclinations of the individual in control of the equipment. In the Industrial Health Research Board investigation quoted* it was found that "the greatest increase in output was obtained when music was played for a period of 75 minutes about the middle of the work-spell, but the most popular arrangement was provided by the introduction of music during alternate half-hours throughout the work-spell." The Board would no doubt agree that different arrangements may be necessary in different organizations, and the quotation indicates the value of experiment to find the most suitable duration and incidence.

---

* Industrial Health Research Board, Report No. 77, p. 73.

TABLE 21

DURATION OF MUSIC AT WORK

Duration	*No.*
Irregularly	16
½ hour	11
Continuous	8
1 hour	6
¾ hour	1
2 hours	1
1½ hours	1
Other arrangements	3
Total	47

Table 22 gives details of what respondents considered the most popular types of music at work (actual numbers).

TABLE 22

POPULARITY OF VARIOUS TYPES OF MUSIC

Type	*No.*
Dance Music	38
Light Music	3
Military Marches	2
Unable to state	4
Total	47

Of the few who were able to say which type of dance music was preferred by their employees, the majority stated that fox-trots or quick tempo dance music were preferred to slower dance music.* The figures

* *Cf.* Industrial Health Research Board Report 77, p. 73.

in Table 22 indicate what are considered the most popular types of music, but the most popular may not have the most beneficial effects, and it is advisable to consider the nature of the music provided in relation to the type of work being carried out.

2. EMPLOYERS' ATTITUDES TO MUSIC AT WORK

Of the 47 respondents in whose factories music was provided at work, 35 (74.5 per cent.) stated that it had beneficial effects on efficiency, while 12 (25.5 per cent.) stated that it had no effects, or that they were unable to observe any effects. None found that music had bad effects.

Unfortunately, few respondents were able to produce evidence of the effects of music, but the following typical comments indicate general experience:—

1. "Installed against monotonous work; keeps mind off work and occasional short pauses to listen to an interesting or 'pretty' piece of music all helps to keep up standard and rate of work."

2. "Music, provided to please employees, is popular with majority and incidentally seems to have good effects on efficiency."

3. "(Music during overtime.) Convinced it is beneficial without minute investigation. Employees doing hammer work keep time to swingy music. Manager has noticed work quicken up with the introduction of music."

4. "Rest-periods tried and found too unsettling. Music found more satisfactory."

5. "More attention paid to work with music. Introduced to avoid boredom and succeeds here."

6. "Find in summer people not so tired mentally at end of day."

7. "Output increased."

8. "Useful to have installed wireless (1) to give the girls something as it is difficult to get the labour, (2) to counteract the monotony."

9. "Effect in workroom stimulating. Swing of work surprisingly apparent. Music has the effect of stopping chatter and work improves in consequence."

10. "Especially in evening, when workers are tired, it bucks them up, and they work better for it."

11. "Music instituted in warehouse where an increase in output of 10-15 per cent. occurred over and above increase due to institution of rest-pauses. The girls prefer work in the warehouse with music to work in other departments where higher wages are earned."

12. "Music merely to ease the monotony—more harmonious atmosphere."

13. "In the warehouse, it is found that slow and fast music affect the speed of work correspondingly. They work to the beat."

14. "Singing is allowed and they work better, because it stops them talking, and people can work and sing, but they cannot work and talk."

15. "Very great help—improves production. Staves off the tired period during morning and afternoon."

16. "Output has definitely increased since introduction of music (but no statistics)."

17. "Has been found that music has a definite calming effect. Found that the fatigue period is definitely lessened with introduction of rest-pauses and music, especially music in some departments."

18. "Good effect noticed. Steadier work generally. Monotony of piece-work operations relieved."

In contrast to these favourable remarks, the following, which were made by respondents in factories which had tried music but found it unsuccessful should be considered:—

1. "Processes too noisy."

2. "Used to have it at meal times, but privilege was abused. Questionnaire was later issued on music, but most workers were against it."

3. "Wireless was tried, but electrical interference too great."

4. "Music was introduced, but almost instantly rejected as employees were against the idea."

5. "Music stopped because women became depressed and the authorities thought music out of place while the workers were on short time. 95 per cent. wanted music to continue, when asked whether they liked it. 5 per cent. said they didn't want it."

Table 23 (actual numbers) indicates the attitude of a number of respondents who do not favourably consider the introduction of music.

The difficulties due to noise may, in many cases, be a justifiable criticism, but a few of the respondents who have introduced music stated that employees can enjoy its benefits in spite of considerable noise.

TABLE 23

REASONS FOR NON-EXISTENCE OF MUSIC

Reasons	*No.*
Nature of work too noisy	50
Nature of work otherwise unfavourable	14
Distracts attention	5
Difficulties of organization	3
Not necessary	1
No demand from employees	1
Never considered	3
Refuse to consider	7
Total	84

3. CONCLUSIONS

(i) Music is provided in 10.7 per cent. of the factories interrogated, and is provided during working hours in 4.8 per cent. In 32 of the 47 factories which comprised the latter group, (4.8 per cent.) rest-pauses were in operation while 43 had refreshments.

(ii) Factories having music during working hours show great variations of duration and incidence.

(iii) Employers in general had no reason to complain of the effects of music in their factories, and 74.5 per cent. considered that it increased efficiency. Many favourable comments were recorded regarding the effects of music; the unfavourable ones came from those who had already abolished it.

(iv) The main reason for the non-provision of music was that of noise.

4. GENERAL COMMENTS ON MUSIC

It is too early yet to make any really satisfactory survey of the use of music in industry. Music at work, though as old as the art itself, is still in its infancy as far as factory use is concerned. It is comparable to the

position of rest-pauses thirty years ago. The attitude to rest-pauses has materially changed since then, and the attitude to music will probably change in the same way, though much more quickly. The novelty of to-day is the commonplace of to-morrow.

Much still remains to be done in the scientific investigation of the problems which it raises. We have alluded to the necessity of further experiment on the most satisfactory duration, incidence and type of music. The relationship of music to other methods of reducing fatigue and boredom demands inquiry. The need for refreshment, and consequently, the desirability of rest-pauses, suggests that music should be used rather to supplement these than to take their place. The incidence of music must, however, be studied in relation to these factors to ensure that both rest-pauses (with refreshments) and music will operate at the times which will contribute most satisfactorily to the welfare of the employee and the efficiency of production.

The possibilities and value of unaccompanied singing are worthy of exploration Singing is the traditional method of the soldier and the Volga boatman of keeping up spirits and rhythm. Perhaps, however, where it is not frowned upon by employers, it has been defeated by the increasing noise of production and the influence of 'canned' music, in the homes of the employees, if not in their factories.*

We must not, however, condemn 'canned' music too harshly, for its presence in the factory may be but the modern equivalent of the flute player of olden days who charmed the ears of the Greek ladies as they carried out their household tasks.

---

* See *The Human Factor*, July-August, 1935. "Music at Work", Louis Katin, pp. 277 *et seq.*

Appendix II

STATISTICAL APPENDIX

THIS inquiry did not include all factories in the areas covered, but subject to certain limitations, the 'samples' may be considered as representative of all similar factories in the areas.

Where it is not possible, owing to considerations of time and cost to obtain information concerning all 'individuals' in the total 'universe', a sample may be used. Such a sample, however, is subject to certain errors which may or may not be measurable, and a second sample of the same size would be unlikely to provide identical results. The results of both samples, moreover, would be expected to differ from the 'true value' which an investigation of all factories would provide. It is therefore desirable to consider the existence of measurable errors and to estimate the extent to which the true value would differ from the 'observed' value. Errors which are not measurable must be minimised, as they have been in this inquiry, by a strict control of the methods in which the data are collected.

The extent of measurable errors may be estimated by a statistical treatment of the results. More particularly, the true value of any percentage will probably lie within the limits of the observed value plus or minus three times the Standard Error (σ) of the observed value (if a normal distribution is assumed). If this criterion is used, the chances are approximately 100 to 1 that the true value will lie within the range of the observed value $\pm 3\sigma$. The value of σ depends upon the observed value and the number of cases in the sample, and is calculated, where results are expressed as percentages, by the formula

$$\text{Standard Error } (\sigma) = \sqrt{\frac{p\,(100 - p)}{n}}$$

where 'p' is the observed percentage and 'n' the number of cases. (100-p) may be expressed more shortly as 'q' *i.e.* p + q = 100 per cent.

The use of this formula may be illustrated by an example.

(1) Table 1—Summary (p. 8) shows that 77.3 per cent. of the 150 factories visited in London have official rest-pauses. This value will differ from the true value by not more that 3 σ in all but 1 in 100 samples.

$$3\sigma = 3\sqrt{\frac{77.3 \times 22.7}{150}} \text{ per cent.}$$

$$= 3 \times 3.4 \text{ per cent.}$$

$$= 10.2 \text{ per cent.}$$

Therefore, the true value will normally be expected to lie within the limits of 77.3 per cent. ± 10.2 per cent., *i.e.* 87.5 per cent. and 67.1 per cent. respectively.

All percentages in this Report are subject to similar sampling errors and should be thus treated before any conclusions are drawn. The following general considerations are of importance.

1. The smaller the sample, the larger will be the sampling error for the same observed value. "The Standard Error of 'p' varies inversely as the square root of 'n', and not inversely as 'n' itself."*

2. The formula cannot confidently be applied to samples of less than 100 cases.

3. The closer 'p' approaches 50 per cent., the greater the possible error.

It is frequently necessary in this Report to discover not only the sampling errors of specific percentages but also whether the differences between two percentages could have arisen by chance, or whether the observed difference represents a real difference in the universe as a whole, *i.e.* whether the difference is 'significant'. The criterion used for this purpose is calculated by the formula

$$\sigma_{\text{diff.}} = \sqrt{\sigma_1^2 + \sigma_2^2}$$

where $\sigma_{\text{diff.}}$ is the Standard Error of the difference of the two percentages,

σ_1 is the Standard Error of the first percentage.

σ_2 is the Standard Error of the second percentage.

EXAMPLE

(2) It appears from Table 3 (iii) (p. 14) that rest-pauses are taken 2 hours after the beginning of the morning shift in 30.9 per cent. of all cases recorded (444), and 2½ hours after the beginning in 15.3 per cent. of all cases recorded. It is necessary to discover whether this difference is statistically significant.

* Yule, G. U. and Kendall, M. G. *An Introduction to the Theory of Statistics.* Charles Griffin & Co. Ltd. 1937, p. 357.

$$3\sigma = 3\sqrt{\frac{30.9 \times 69.1}{444} + \frac{15.3 \times 84.7}{444}} \text{ per cent.}$$
$$= 3 \times 2.8 \text{ per cent.}$$
$$= 8.4 \text{ per cent.}$$

The difference between 30.9 per cent. and 15.3 per cent. is greater than 8.4 per cent., *i.e.* the difference is significant. This formula is used also when testing the significance in percentage figures between separate groups (areas or size-groups).

EXAMPLE

(3) Table 1 Summary (p. 8) shows that 77.3 per cent. of the 150 factories visited in London have official rest-pauses, while the percentage for the 150 Cardiff factories is 50.0. Is this difference statistically significant?

$$3\sigma = \sqrt{\frac{77.3 \times 22.7}{150} + \frac{50 \times 50}{150}} \text{ per cent.}$$
$$= 3 \times 5.3 \text{ per cent.}$$
$$= 15.9 \text{ per cent.}$$

The difference between 77.3 per cent. and 50 per cent. is greater than 15.9 per cent., *i.e.* the difference is statistically significant.

Since the numbers of cases upon which area percentages are based are much smaller than combined area figures, the reservations outlined in this Appendix are of particular importance when interpreting area differences. The significance of differences between percentages based upon less than 100 cases can be estimated only by somewhat detailed statistical analysis. Tables involving small numbers of cases nevertheless do give qualitative information of the type of answer given and certain conclusions may be drawn from outstanding items.

REFERENCES

1. Yule, G. U. and Kendall, M. G. *An Introduction to the Theory of Statistics.* Charles Griffin & Co. Ltd. 1937.

2. Brown, T. H. *The Use of Statistical Techniques in Certain Problems of Market Research.* (Harvard Business School, Division of Research, Business Research Studies. No. 12.)

Printed in Great Britain by The Shenval Press, Ltd., 56 Bloomsbury Street, London WC1

Officers and Council

President :

THE RIGHT HON. THE EARL OF DUDLEY, M.C., D.L.

Vice-Presidents :

SIR WILLIAM BRAGG, O.M., K.B.E., D.Sc., P.R.S.
THE RIGHT HON. VISCOUNT D'ABERNON, P.C., G.C.B., G.C.M.G., F.R.S.
SIR FREDERICK G. HOPKINS, O.M., D.Sc., LL.D., F.R.S.
THE MOST HON. THE MARQUESS OF LINLITHGOW, P.C., K.T., G.M.S.I., G.M.I.E.
THE RIGHT HON. LORD MACMILLAN, P.C., G.C.V.O., K.C., LL.D.
SIR CHARLES SHERRINGTON, O.M., G.B.E., M.D., F.R.S.
THE RIGHT HON. LORD STAMP, G.C.B., G.B.E., Sc.D., LL.D.
HENRY J. WELCH.
SIR ROBERT WITT, C.B.E., D.Lit., F.S.A.

Chairman : LT.-COL. SIR JOHN KEANE, Bart., D.S.O., D.L.

Vice-Chairmen : SIR JOHN MANN, K.B.E., M.A., and E. S. BYNG, M.I.E.E.

Hon. Scientific Adviser : CHARLES S. MYERS, C.B.E., M.D., D.Sc., LL.D., F.R.S.

Secretary : C. B. FRISBY, B.Com.

Council and Technical Advisory Board:

THE RT. HON. LORD ASKWITH, K.C.B., K.C., D.C.L.
*†F. AVELING, M.C., PH.D., D.Sc., D.LITT.
†THE LADY RUTH BALFOUR, M.B., B.S.
*P. B. BALLARD, M.A., D.LITT.
SIR THOMAS BARLOW, K.B.E.
*F. C. BARTLETT, M.A., F.R.S.
SIR STEVEN BILSLAND, BART., M.C., J.P.
SIR HAROLD BOWDEN, BART., G.B.E.
*WILLIAM BROWN, M.D., D.Sc., F.R.C.P.
*†CYRIL BURT, M.A., D.Sc.
*A. M. CARR-SAUNDERS, M.A.
*E. P. CATHCART, C.B.E., M.D., D.Sc., F.R.S.
SIR WALTER CITRINE, K.B.E.
*H. E. COLLIER, M.C., M.B., CH.B.
*EDGAR L. COLLIS, C.B.E., M.A., M.D., M.R.C.P.
MRS. J. S. COURTAULD
*WINIFRED C. CULLIS, C.B.E., D.Sc., LL.D.
*MILLAIS CULPIN, M.D., F.R.C.S.
*SIR HENRY DALE, C.B.E., M.A., M.D., D.Sc., LL.D., F.R.S.
*E. SALTER DAVIES, C.B.E., M.A.
SIR ERNEST DEBENHAM, Bart.
*JAMES DREVER, M.A., B.Sc., D.PHIL.
†NORMAN W. DUTHIE, C.A.
*F. M. EARLE, D.Sc.
THE RT. HON. LORD EBBISHAM, G.B.E., D.L.
BEATRICE EDGELL, PH.D., D.LITT.
A. P. M. FLEMING, C.B.E., M.Sc., M.I.E.E.
*M. GREENWOOD, D.Sc., F.R.C.P., F.R.S.
*SIR RICHARD GREGORY, BART., D.Sc., LL.D., F.R.S.
SIR ROBERT HADFIELD, BART., Sc.D., F.R.S.
R. C. HAZELL, J.P.
W. L. HICHENS, M.A.
*A. V. HILL, O.B.E., M.A., LL.D., M.D., Sc.D., SEC.R.S.
*SIR LEONARD HILL, M.B., LL.D., F.R.S.
FRANK HODGES, J.P.
*P. D. INNES, C.B.E., M.A., D.Sc.
†L. C. JARRETT
*†D. T. JOHN
*LL. WYNN JONES, M.A., PH.D.
C. W. KIMMINS, M.A., D.Sc.
*REX KNIGHT, M.A.
SIR WILLIAM LARKE, K.B.E., M.I.E.E., F.INST.F.
SIR KENNETH LEE, LL.D.
J. SPEDAN LEWIS
COL. SIR HENRY LYONS, D.Sc., F.R.S.
*C. A. MACE, M.A., D.LITT.
*A. MACRAE, M.A., M.B., CH.B.
J. J. MALLON, M.A., LL.D., J.P., C.H.
LORIS E. MATHER, M.A., M.I.MECH.E.
THE RT. HON. LORD MELCHETT
*G. H. MILES, D.Sc.
SIR GEORGE MITCHELL, D.L., LL.D., M.A., J.P.
†AIR VICE-MARSHAL SIR DAVID MUNRO, K.C.B., C.I.E., M.B., F.R.C.S.
SIR EVELYN MURRAY, K.C.B.
*SIR T. PERCY NUNN, M.A., D.Sc., LITT.D., LL.D.
*O. A. OESER, M.Sc., D.PHIL., PH.D.
*SIR JOHN PARSONS, C.B.E., D.Sc., F.R.S.
S. W. PASCALL, J.P.
*T. H. PEAR, M.A., B.Sc.
SIR GEOFFREY K. PETO, K.B.E.
†W. PIERCY, C.B.E., B.Sc.
SIR ARTHUR PUGH, C.B.E., J.P.
*E. M. RICH, B.Sc.
†B. SEEBOHM ROWNTREE, C.H., J.P.
*E. G. SAVAGE, C.B.
*F. H. SPENCER, D.Sc.
*G. H. THOMSON, PH.D., D.Sc.
*R. H. THOULESS, M.A., PH.D.
SIR HENRY T. TIZARD, K.C.B., F.R.S.
S. C. TURNER, F.C.I.I.
†JOHN URIE, O.B.E., C.A.
*C. W. VALENTINE, M.A., D.PHIL.
*H. M. VERNON, M.A., M.D.
A. B. WARING
†ALAN F. WELCH
LT.-COL. SIR ARNOLD WILSON, K.C.I.E., C.S.I., C.M.G., M.P.
SIR DUNCAN R. WILSON, C.V.O., C.B.E., M.A.
†GERTRUDE LADY WORTHINGTON-EVANS, C.B.E.
SIR HAROLD E. YARROW, Bart., C.B.E.

† Executive Committee.
* Technical Advisory Board.

Hon. Auditors:

Messrs. MANN, JUDD, GORDON & CO.

Hon. Solicitors:

Messrs. STEPHENSON, HARWOOD & TATHAM

Scottish Division :

Chairman: JOHN URIE, O.B.E., C.A. *Director:* C. A. OAKLEY, B.Sc., Ed.B., M.I.E.S.

Secretary: E. H. HARRIS, A.S.A.A.

Address: 142 St. Vincent Street, Glasgow, C.2.