A SURVEY OF SMALL FACTORIES*

BY

MARGOT JEFFERYS and C. H. WOOD

From the Department of Public Health, London School of Hygiene and Tropical Medicine

(RECEIVED FOR PUBLICATION APRIL 27, 1959)

This survey was undertaken by a group of doctors, nurses, and lecturers in the Department of Public Health of the London School of Hygiene and Tropical Medicine as part of the teaching programme for the Diploma in Public Health. Fifty small factories in an area of a metropolitan borough were invited to answer questions concerning their industrial processes, their labour force, their premises, their first-aid provision, and the visits they received from officials of local and central government. Forty-eight of these factories responded and observations were made by teams of three recording independently of each other in 45. A variety of industries was represented in these 48 firms, half of which employed less than 10 workers.

The working environment, in respect of sanitary arrangements, cleanliness and tidiness, lighting on stairs and passage ways, was considered to be unsatisfactory in many firms. Some instances of inadequate safeguards of machines were seen. The accident rate was found to be rather less than the computed national rate for manufacturing industry in 1956.

First-aid equipment and workers were also considered to be deficient in a number of instances. In case of accidents and for the treatment of minor ailments most firms made use of a local casualty and out-patient department of a general hospital. This service was considered quite adequate.

Many firms had not been visited by the Factory Inspector or his deputy during the previous year. Rather more had received visits from the local authority health inspectors. Many firms expressed confusion about the duties and functions of their various official visitors.

The conclusions drawn from this limited enquiry were that the working conditions in small factories are often unsatisfactory; that in areas such as the one surveyed it is unrealistic to think in terms of development of an industrial health service similar to those operating in Slough and Harlow; and that the greatest impact on environmental conditions might be made by an improved and simplified system of inspection especially adapted to the needs of the small factory.

There is no specific provision in the National Health Service for industrial medical services. Most large undertakings, however, now employ industrial medical officers and nurses who, by dealing promptly and efficiently with injuries and minor sickness and by investigating environmental hazards, can save the firms and their employees much suffering, time, and money.

The small firm has not the resources to employ full-time medical workers of its own. In some areas—notably Slough and Harlow—industrial health services have been organized on a collective basis; but such schemes are still rare and none of them covers the very smallest firms in the older industrial districts (Slough Industrial Health Service, 1957; Taylor, 1958). Over 80% of the factory establishments in Great Britain employ fewer than 25 workers and the majority of these are located in the large cities of Britain in areas developed in the nineteenth century.

What are conditions like in these small firms? What medical services, if any, do they possess or make use of? Is it worth their while to run an industrial health service on a collective basis?
A SURVEY OF SMALL FACTORIES

These were the questions which we wanted to investigate. We started our survey in December, 1957, and completed the field work before the report by the Factory Inspectorate on industrial health in Halifax had been published (Ministry of Labour, 1958). The field work was done by doctors and nurses, none of whom had had any special training in factory inspection.

Area and Method

Practical considerations dictated the choice of an area to be investigated. Because time was limited and no special funds were available, we had to choose an area within easy reach of the London School of Hygiene and Tropical Medicine containing the minimum number of factory establishments which would make the investigation worthwhile. We chose, therefore, a near-by ward in a metropolitan borough, which we knew contained about 50 factories. It was an area of mixed, small-scale industry and of residential housing, largely developed in the late nineteenth and early twentieth centuries. In these respects we felt that it resembled many industrial areas in other large towns and in other parts of London.

We obtained a list of all the registered factories within the ward from the Medical Officer of Health, and arranged that each should be visited by a team of three, drawn from the study group. Factory owners or managers were notified in advance that we would be calling and would be grateful for their help.

A copy of the questionnaire used is given in Appendix I. Both the content and the layout had been changed after a preliminary trial. Where possible, the questions were of the Yes/No or multiple choice variety with the answers pre-coded and numbered so that all the recorder had to do during the interview was to ring the appropriate symbol. Some questions, such as number 25, which asked for a description of any accidents happening in 1957, required a more detailed answer which was recorded as nearly as possible verbatim.

Broadly speaking, questions 1-14 related to the number and type of employee and the fabric and age of the premises. Questions 15-18 were concerned with hazards involved in the work, and questions 19-31 referred to the medical arrangements and the provisions for dealing with accidents and environmental hazards. Questions 32-37 concerned visits which the firm might have received from various authorities.

For the assessment of the environment, each of the three observers had a separate card and filled it in independently immediately after inspecting the factory. A copy of the card is also given in Appendix I. These assessments were essentially subjective judgments. They were phrased in such a way that the answer "yes" implied an unfavourable assessment. In addition, there was space on the card for the observer's general impression of the factory and for notes on any hazards which he thought were not adequately dealt with by the management or workers. We also drew up a schedule of instructions and definitions to ensure that, amongst ourselves, we achieved as great a degree of uniformity of judgment as possible.

The main enquiry took place during January and February, 1958. Each week, five teams (consisting of different combinations of individuals on each occasion) visited three factories. At each factory the answers to our questions were filled in by one member of the team acting as recorder; every member of the group acted as recorder for at least one interview.

Results

Size and Nature of Sample.—The area selected contained 50 factories. Of these, 48 answered our questions and 45 allowed a visit to their works. The number of employees ranged from 180 in one factory to one man working alone in another. The distribution of factories by size, compared with the national figures, is given in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Number of Employees</th>
<th>Survey Area</th>
<th>Great Britain* (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 10</td>
<td>23 (48%)</td>
<td>69</td>
</tr>
<tr>
<td>11 – 25</td>
<td>16 (33%)</td>
<td>14</td>
</tr>
<tr>
<td>26 – 50</td>
<td>3 (6%)</td>
<td>7</td>
</tr>
<tr>
<td>51 – 100</td>
<td>5 (10%)</td>
<td>4</td>
</tr>
<tr>
<td>101 +</td>
<td>1 (2%)</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>48 (100%)</td>
<td>100</td>
</tr>
</tbody>
</table>

* Figures obtained from the report of the Halifax Survey (1958)

It will be seen that over 80% of the factories in our area and in the country as a whole employ between one and 25 people. These, and most subsequent figures, relate to the 48 factories where we obtained an interview. We do not know exactly how many work people were employed in the two firms where interviews were not obtained. We knew, however, that they had few employees and their exclusion from our figures is not likely to alter the general pattern.

The main types of industry represented and the percentage of workers employed in them in our area and in Great Britain as a whole are shown in Table 2. A list of the major products of the factories
surveyed is given in Appendix II. The diversity of work done in these small factories in one area is noteworthy.

### Table 2

**DISTRIBUTION OF FACTORIES AND WORKERS BY TYPE OF INDUSTRY IN SURVEY AREA AND GREAT BRITAIN, 1958**

<table>
<thead>
<tr>
<th>Manufacturing Industry Groups*</th>
<th>Survey Area</th>
<th>Great Britain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factories No.</td>
<td>Workers</td>
</tr>
<tr>
<td>Chemical and allied</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Metal engineering, vehicles,</td>
<td>20</td>
<td>420 (42%)</td>
</tr>
<tr>
<td>electrical</td>
<td>6</td>
<td>70 (7%)</td>
</tr>
<tr>
<td>Textiles, clothing, leather</td>
<td>4</td>
<td>122 (12%)</td>
</tr>
<tr>
<td>Food, drink, tobacco</td>
<td>8</td>
<td>228 (23%)</td>
</tr>
<tr>
<td>Precision and musical instruments, wood and furniture</td>
<td>10</td>
<td>164 (16%)</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All manufacturing industries</td>
<td>48</td>
<td>1,006</td>
</tr>
</tbody>
</table>

* Based on an amalgamation of some of the groups listed in the standard industrial classification (Ministry of Labour Gazette, 1958).

The original purpose and estimated age of the buildings now used as factories are shown in Table 3.

### Table 3

**ORIGINAL PURPOSE AND DATE OF CONSTRUCTION OF PREMISES**

<table>
<thead>
<tr>
<th>Original Purpose of Present Premises</th>
<th>No.</th>
<th>Date of Construction of Present Premises</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory</td>
<td>18</td>
<td>Pre 1918</td>
<td>40</td>
</tr>
<tr>
<td>Dwelling</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Railway arch</td>
<td>3</td>
<td>1919-1945</td>
<td>2</td>
</tr>
<tr>
<td>Outhouse</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shop</td>
<td>2</td>
<td>Post 1945</td>
<td>6</td>
</tr>
<tr>
<td>Mixed</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>48</td>
<td><strong>Total</strong></td>
<td>48</td>
</tr>
</tbody>
</table>

Only 18 of our firms were operating in premises originally built as factories. All the rest were using converted premises of one sort or another, including railway arches, shops, garages, and private houses. They formed a motley collection of buildings of all shapes and sizes. Moreover, 40 out of 48 firms were operating in premises built before 1918. Only six were in buildings of post-war vintage.

Inevitably, these factories face problems of a very different kind from those faced by the factories in the Slough Health Service, for example. Slough’s factories were built mainly between the two world wars, while the industrial medical scheme at Harlow, a post-war new town, to take another example, caters for firms working in up-to-date premises, all built in the last six or seven years.

Our factories, on the other hand, were distinguished by their venerable age and their makeshift character; decay was more prevalent than construction. But in this respect we did not feel that our area was necessarily unlike many other urban areas in England. Some of the different types of factory building represented in our survey are illustrated in Figs. 1-7.

**Sanitary and Washing Facilities.**—The Factories Act, 1937, lays down that “sufficient and suitable conveniences must be provided, kept clean and efficiently lighted” and that “where both sexes are employed, there must be separate accommodation for each sex”. The Act also calls for “adequate and suitable facilities for washing, conveniently accessible, provided with soap and clean towels or other suitable means of cleaning and drying”.

The problem, of course, is to agree on what is regarded as “sufficient”, “convenient”, or “adequate”. Opinions on these matters are likely to differ among different sections of the community, not to speak of differences between individual doctors. However, in eight factories the three observers agreed that by no stretch of the imagination could the sanitary accommodation provided be described as either “suitable” or “clean”, and in three instances the firms concerned had no lavatory or urinal at all. We suspect that we have over- rather than under-estimated the amount of lavatory accommodation and washing facilities, because it was evident that some firms shared them. For example, the five factories around a courtyard (Fig. 5) where there was one urinal, claimed it as their own.

As for washing facilities, only one small firm was without so much as a tap and basin; the rest complied with the law in varying degrees. One employer, with an eye to costs, and as a result of a court case, had ingeniously installed a wooden trough, fed by overflow hot water from a dirty tank, for his workers to wash in. Two other firms allowed their workers to share this amenity.

We were not able to obtain illustrative photographs of inadequate facilities. Fig. 8 is an example of facilities such as we met quite frequently and which we considered adequate, if not desirable. It shows the separate accommodation for women in a building which housed a toymaker’s shop, an electrical firm, and a metal working shop.

**Environmental Factors.**—First, we assessed certain environmental conditions—temperature and ventilation, lighting, noise, cleanliness—which are believed to have an effect on general health and well being. Secondly, we listed those manufacturing operations and processes known to be associated with certain specific industrial diseases and accidents.
The accurate assessment of any one environmental factor requires frequent measurements with special instruments over a prolonged period of time. This was not attempted. What we did was to ask each of the three observers to record, independently of each other, whether they regarded a particular environmental factor as sufficiently bad to be likely to have an adverse effect on the health of those exposed. Despite our attempts to obtain agreement on criteria, the standards expected by our observers, none of whom were experienced factory inspectors, varied. They were largely based on their previous experience in other health fields. We discarded, therefore, adverse reports by only one observer and included those where two or all three observers agreed that the conditions were unsatisfactory.

We were pleased to note that under the impressive heading General Assessment of Layout and Efficiency of Plant and Machinery in relation to the Health of the Worker, the authors of the Halifax report wrote:

"After careful consideration the survey team came to the conclusion that little useful purpose could be served in tackling this most complex subject unless each process was dealt with separately. This would have taken far too long and could not be undertaken in a general survey."

With this conclusion our group agreed.

Overcrowding.—The legal requirement is that: "A factory shall not, while work is carried on, be so overcrowded as to cause risk of injury to the health of the persons employed therein." A minimum of 400 cubic feet per person is then given as the statutory requirement. Only one of the factories visited, a shirt maker employing 23 workers, was considered to be below this standard. The room was small and the machines close together. The girls sat in four rows facing each other and were surrounded by bales of cloth.

Temperature.—Temperature in all workrooms must be "reasonable" and where a substantial amount of time is spent sitting down, the temperature must be over 60°F. after the first hour. As a group, we were more than aware of the difficulties of assessing "reasonableness". Some of our members came from the tropics and had their first experience of snow while actually trudging round the area; others of us were thoroughly used to the draughts which the Englishman euphemistically refers to as "fresh air". But, after visiting these factories, some of us felt that it was the nature of the work rather than the comfort of the worker which was often the deciding factor in the matter of temperature. For example, pianos, it seems, prefer a warm, dry atmosphere and the piano factories, which we visited on a cold day, were comfortably
Fig. 5.—Courtyard on to which five factories open.

Fig. 6.—Nineteenth century factory building now occupied by four small firms.

Fig. 7.—A factory entrance.
warm. The fish curer's and glass merchant's factories, however, which we visited on the same day, struck us as decidedly cold.

Noise.—Noise is not mentioned in the Factories Acts and no statutory limits have, so far, been produced. Compensation for hearing loss has only been claimed at Common Law. In one or other part of three factories—a furniture works, a piano-forte part works, and a sign manufacturer's shop—the noise was considered "excessive". In the last, we could not hear an operator's voice above the noise of his machine; but he told us that he did not mind the noise because "I've got used to it".

Lighting.—The provision of "sufficient and suitable" lighting, whether natural or artificial, in every part of the factory in which persons are working or passing was a new requirement in the 1937 Factories Act. We assessed the existing lighting under two headings, "at the work bench" and "on the stairs". We did not see any gross instance of bad lighting at the work benches. On several occasions we thought that there might have been some glare from unshaded electric lights but we did not make a single judgment of inadequacy. We were struck by the number of occasions on which we saw filthy windows. The dirt and dust of ages coated many of them, including those in an electro-plating factory in which broken glass had not been replaced but the holes filled up with cardboard and newspaper.

We were rather more critical of lighting on stairs and passageways. We recorded nine instances of bad lighting. In one case, where the stairway was in continuous use, the stairs were narrow, rickety and steep, the handrail was broken, and the only lighting was a low wattage bulb high up on the ceiling.

Cleanliness and Tidiness.—The law requires that every factory shall be kept in a clean state and specifies that "accumulations of dirt and refuse must be removed daily from floors and benches of work-rooms and from the staircases and passages"; that "the floor of the workroom must be cleaned at least once a week by washing or, if it is effective and suitable, by sweeping or other method" and contains provisions for "cleaning or whitewashing or colour-washing walls, tops of rooms, passages, and stair-cases at least once every 14 months". The last requirement is not enforced in non-power factories where less than 10 persons are employed. There are no legal standards for tidiness, but this was also considered, more because of its possible relation to accidents than to disease.

Our assessments were made on overall conditions without specific reference to benches, floors or walls. Ten factories (22%) were considered unsatisfactory. These were mainly the smaller factories, seven of them having less than six employers each. Although 22% of the factories were unsatisfactory in this respect, they only accounted for 8% of the employees.

Among the dirty places that we saw was a small shoemaker's shop where fragments of the employees' lunch collected among the days-old accumulation of odd pieces of leather; there was also a wash-
FIG. 9.—An accumulation of dust from grinding.
FIG. 10.—Office, workshop, or canteen?
FIG. 11.—Ingots and junk stacked around a furnace.
FIG. 12.—An electro-plating shop.

room used by the workers as a kitchen but never cleaned as far as we could see. "Untidy" places, on the other hand, included one where the floor space was covered with iron and metal ingots stacked one on top of each other, higgledy-piggledy. One worker told us nonchalantly that he quite frequently had an ingot dropped on his toe but that you "don't have to worry as nails come off and grow again". Another factory was described by one observer as being "untidy, dangerous, full of half-made furniture blocking the passageways, and presenting great fire hazards".

In conclusion, and very much in general, it would
A SURVEY OF SMALL FACTORIES

be fair to say that we saw among our 48 factories some conditions which we thought could hardly be bettered, considering the age of the buildings, and others which, from the standpoint of dirt and the accumulation of rubbish could scarcely have been worse (Figs. 9-12).

Hazards.—It is generally, although by no means always, true that in small factories each man carries out many varied operations so that, even if one of the operations is potentially dangerous, his exposure to it is likely to be intermittent. We tried to identify those operations and machines known to cause trouble in manufacturing industry, on the assumption that, even if only used intermittently, they were still potentially dangerous and should be subject to inspection. As a rule we did not attempt to make any decision as to whether the necessary precautions for safe usage were adequate, although we did note some instances where we were convinced that safeguards were inadequate. Questions about protective clothing were asked in order to find out whether dangers were at least recognized.

Operations Involving Production of Dust or Fume.—Altogether, 35 operations producing dust or fume were noted. Paint-spraying was done in eight factories, electro-plating (using chrome, cyanide, etc.) in four, degreasing (with trichlorethylene) in two, shot-blasting in one, various forms of metal grinding and polishing in eight. Diesel fumes, cotton dust, and, incidentally, the smell of smoked salmon and roasted peanuts were noted in others. In some instances these hazards were recognized and local exhaust ventilation was provided. Where it was present, however, it did not always appear efficient. In one case paint was still being deposited on the back of the man who was spraying. In other cases, masks were worn, sometimes round the neck and sometimes made out of a rag and held in place with a rubber band.

Chemicals Used.—The list of chemicals used was undoubtedly incomplete, but in 30 factories the use of potentially dangerous chemicals was noted. Caustic acids and alkalis, which require safe handling techniques to avoid the risk of burns, were noted 13 times. Carbon tetrachloride, a dangerous narcotic and liver poison, was used in three factories. Other chemicals capable of causing the commonest of prescribed industrial diseases, dermatitis, included naphthalene, detergents, mineral oils, kerosene, and many others.

Gloves were occasionally provided, but more often such remarks as, "we are careful, you know", or "we sort of get used to it", were made. One man obliged by dipping his bare arm into a fuming electro-plating tank, commenting as he wiped the liquid off his trousers, "It stings a bit, but does not bother me. I'm immune."

Power-driven Machinery.—Thirty-nine (80%) of the 48 factories questioned were classed as "using mechanical power" and the machines found in them are shown in Table 4.

Table 4

<p>| Types of Power-driven Machinery Used and the Number of Factories in Which They Were Found |
|----------------------------------|----------------------------------|</p>
<table>
<thead>
<tr>
<th>Machine</th>
<th>No. of Factories in which Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grinding wheels</td>
<td>23</td>
</tr>
<tr>
<td>Drilling machines</td>
<td>21</td>
</tr>
<tr>
<td>Circular saws</td>
<td>12</td>
</tr>
<tr>
<td>Guillotines</td>
<td>12</td>
</tr>
<tr>
<td>Power presses</td>
<td>10</td>
</tr>
<tr>
<td>Cranes or hoists</td>
<td>9</td>
</tr>
<tr>
<td>Planing or sanding machines</td>
<td>6</td>
</tr>
<tr>
<td>Metal lathes</td>
<td>4</td>
</tr>
</tbody>
</table>

Most of these machines were well guarded and often only used by experienced craftsmen. However, there were instances where sufficient precautions were not taken. In one furniture factory, for example, there were four inadequately guarded circular saws, all running simultaneously, in a crowded workshop.

Accidents.—The annual report of the Chief Inspector of Factories for 1956 (Minister of Labour and National Service, 1958) gives the total number of accidents occurring in factories during the year as 160,116. The estimated factory population was 7,850,000. This gives an accident rate of between 20 and 21 per 1,000 workers employed per year. The commonest causes of accident were the handling of goods (27%), power-driven machinery (15%), persons falling (14%), stepping on or striking against objects (8%), struck by falling objects (8%), and use of hand tools (8%). In the tabulation of power-driven machinery accidents by cause, two-thirds of them are to be found in an unclassified group. However, the two types of machinery causing half the classified accidents—lifting gear and circular saws—were well represented among our small factories.

All the potential causes of accidents listed by the Chief Inspector were present, therefore, to a greater or lesser extent in the factories in our area; and accidents did occur. An examination of the factory accident books revealed 17 accidents in the 12 months before our enquiry, giving an accident rate of approximately 17 per 1,000 employed, or just below the national accident rate. However, 21 (44%) of our factories, including all the smallest, had no accident book. It might consequently be fairer to
relate the accidents only to those factories which had books, in which case the accident rate would have been nearer to the national figure.

The effect of the size of the working group on its accident rate—the smaller the group the lower the rate—(Acton Society Trust, 1953) is clearly not the only reason for the low rates for small factories given in the report of the Chief Inspector of Factories for 1954 (Minister of Labour and National Service, 1955). Inadequate or non-existent records contribute to this result.

On the other hand, we felt that the small firms in this area did attract a type of employee who was less likely to have a serious accident than did the large firms. For example, we gained the impression that the craftsman, and particularly the individualist, who chooses to work "on his own" and can turn his hand expertly to a number of trades, was more strongly represented than we would have expected in larger firms. As a result of his interest in work and the closer relationships between employer and employed which are possible in small firms, such a man is, perhaps, more willing to put up with unsatisfactory physical surroundings than other workers. He may also be less liable to accidents, even if hazards are greater, because he is less easily distracted from his work, and because his competence ranges over a wider variety of operations.

First Aid.—Every factory establishment, however small, is required under the Factories Act, 1937, to make some provision to cope with accidents which may take place at work. This means first and foremost that it must have a first-aid box.

The first-aid box must contain only appliances or requisites for first aid. For factories employing fewer than 10 workers, the minimum contents of the box must be (a) sterile dressings, (b) iodine or gentian violet, (c) sal volatile. As the number of employees increases, so the firm is required to increase the number of dressings and the range of appliances.

In 43 of the 48 factories visited we saw a first-aid box. In a further two we were told one existed, but we did not actually see it, and in three there was no box at all. All but one of these boxes contained some antiseptic; fortunately, perhaps, this was not often iodine. Three boxes contained no sterile dressings. On the whole, we felt that there was a good deal to be desired where first-aid equipment was concerned. No fewer than 12 out of the 43 factories were unanimously considered to be deficient in this respect by the three observers.

Moreover, we found that managements sometimes kept supplies locked away on the grounds that, if they were kept in boxes, they would be stolen. One works manager, who told us this, was unable to find the key to the drawer in which, he assured us, the sterile dressings and antiseptics were kept.

The Factories Act also insists that the box should be under the control of a responsible person who, if more than 50 people are employed, must be trained. In our area, it seemed to us that there was a so-called responsible person in rather less than half of the firms and, of the six firms with more than 50 employees, only three had men who could by any stretch of the imagination be described as trained. In short, we gathered much the same kind of impression as the Halifax surveyors who stated that "it was largely a matter of luck rather than planning that first-aiders were available".

Provision of Health Services.—We were also interested to see whether firms made any provision beyond those required by law. We found very little. Only one establishment, the bus depot, had a special treatment room. No factory employed a nurse, either full or part-time. Three firms out of the 48 (the three largest) had definite arrangements with doctors. These were to examine new employees, and, at the bus depot, the responsibility of the medical officer extended to interest in the environment more generally.

The most common form of voluntary provision beyond the minimum required by law was the dispensing of aspirins. Thirty firms kept these in the first-aid box and eight said that they were asked for frequently.

We wanted to know what firms were likely to do in case of a medical emergency. We asked them, therefore, what they would do if one of their employees were to cut himself badly. Thirty-nine replied promptly that they would take the worker to hospital as quickly as they could. Seven would have called an ambulance rather than take the worker to hospital themselves. Only two would have called on a local general practitioner for help.

The hospital facilities for the area were unusual. There were two large general hospitals, both with casualty departments, about three-quarters of a mile and a mile away respectively from the centre of our area. One of these hospitals, however, had a casualty and out-patient department in premises situated even nearer, that is within seven to 12 minutes' walk from any part of our area. This department dealt only with patients who came on their own; ambulance cases were taken to the main hospital. In the local casualty department a doctor and nursing staff were on duty 24 hours a day. Approximately 100 patients were seen each day and the waiting period to see a doctor was estimated to be half an hour and to see a nurse 10 minutes.
A SURVEY OF SMALL FACTORIES

19

In order to estimate roughly the proportion of cases dealt with at this centre that were "industrial" rather than "domestic", a sample of entries in the daily register was analysed. The "industrial" cases were taken to be the bulk of those between the ages of 16 and 65 who attended between 8.30 a.m. and 6.30 p.m. In nearly all these cases where Christian names were given they appeared to be males. Seventy per cent of the cases were in this group. The causes for attendance among the group were injuries to fingers and hands, 30%; other injuries, 20%; burns, 10%; miscellaneous conditions, 40%. The Casualty Officer thought that many of the injuries were so trivial that they could have been dealt with by a good first-aider at the workplace of the individual concerned.

There was no doubt, however, that the firms thought these arrangements to call on the local casualty department entirely adequate and appropriate. Only one manager thought that a special industrial service with a doctor available and a nurse to do regular dressings might be desirable. The others usually argued that accidents were too infrequent to justify any special services.

Official Inspections.—All factories are subject to inspection in order to see that they comply with the Factories Acts and other regulations concerning the health and safety of employees.

Various government departments and local authorities have different people with statutory duties to perform in connexion with factories. Table 5 shows who these are and how often the factory owners said that they visited their factories.

<p>| Table 5 |</p>
<table>
<thead>
<tr>
<th>FREQUENCY OF VISITS TO 48 FACTORIES BY GOVERNMENT AND LOCAL AUTHORITY OFFICIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officials</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Local authority health inspector</td>
</tr>
<tr>
<td>Medical officer of health</td>
</tr>
<tr>
<td>District factory inspector</td>
</tr>
<tr>
<td>Appointed factory doctor</td>
</tr>
<tr>
<td>Medical inspector of factories</td>
</tr>
<tr>
<td>Alkali inspector</td>
</tr>
</tbody>
</table>

The local authority health inspector visits all factories to inspect the sanitary arrangements and canteens where they exist. He has special duties in food processing factories. He was the most frequent visitor in the factories in our area, having visited almost every factory at least once in the last year. In the borough as a whole, three health inspectors spend nearly all their time visiting factories. They have to cover over 2,000 factories between them.

The medical officer of health would normally not carry out any routine inspection; but some medical officers like to know what goes on in the factories in their area. Nine of our factories said that they had been visited by the medical officer of health, often in connexion with teaching students. These included all the food processing firms.

The district factory inspector with an assistant covers an area, of which the borough is only a part, in which there are about 3,000 factories. These inspectors had visited about half the factories we saw during the past year. Thirteen of our factory proprietors, however, thought they had never had a visit from them.

The appointed factory doctor, whose job it is to examine new recruits aged 16-18 and those engaged in dangerous trades, was said to have visited only two factories. It should be pointed out, however, that some firms sent their young workers to his consulting rooms for examination. The area we surveyed was only a part of the area he covered. In all he made some 700 examinations of young workers during a year, detecting significant abnormalities in less than 1%. The medical inspector, who is one of only 15 in the country as a whole, and the alkali inspector, who today is concerned largely with smoke abatement, had not visited the factories in the area during the last year.

It was abundantly clear that the small firms were often confused by the duties and powers of their different visitors. One owner, when asked whether he had been visited by the alkali inspector, told us that he could not remember any such gentleman, but that he was so pestered by so many inspectors of all sorts that he could not believe that he would have been missed. On the other hand, we discovered one firm in which the factory inspector had found many faults on numerous occasions. To avoid the expense of complying with his requirements the manager took his two skilled employees into partnership and sacked the boy. As no one was then employed the premises ceased technically to be a factory. When the fuss had died down the boy was taken on again, but was liable to instant dismissal or promotion to full partnership should the factory inspector reappear.

It is only fair to conclude by saying that the various inspectors whom we met were fully aware of their inability to meet all the needs in the area.

Discussion

Our investigation can be described as a preliminary reconnoitre of a field about which remarkably little has been written. Our aim was two-fold; first, to identify the health needs of small factories, and second, to estimate how far
these needs were being met either by services which the firms themselves provided or by those available in the neighbourhood. We had neither the time nor the resources to make it a thorough or authoritative survey of all the factors involved; moreover, there was a large element of Hobson's choice in the selection of an area in which the issues could be investigated. Thus, we recognized that the area surveyed, like most central London boroughs, was rather better served by hospitals than by most provincial industrial centres. In addition, we discovered that it had on its doorstep a special branch casualty department capable of dealing expeditiously with minor industrial ailments and accidents. In other respects, however, it probably resembled many areas of mixed industrial and residential development near the centre of industrial towns. Despite the limitations, therefore, we feel that it is worthwhile, not only to state our findings, but also to suggest some of the conclusions which we have drawn from them.

Health needs may be roughly divided into therapeutic and preventive. The services which meet the first kind of need are directed to the individual who has an accident or falls ill, whereas the preventive services are predominantly concerned with the control of the environment, although they too provide some services to individuals, for example, through routine examination or mass miniature radiography.

In the area investigated, the main shortcoming in the therapeutic health services was the poor standard of first aid. In many firms the equipment provided and the training of those in charge could, by no stretch of the imagination, be considered satisfactory. Improvement was urgently needed. The question is, how such a drastic improvement can be brought about. We have little doubt that the most effective way of securing a reasonable standard of first aid in the small firms would be to increase inspection. The management's own enlightened self-interest is not likely to extend far enough to permit the expenditure of much time and money on the necessary training and equipment without a good deal of pressure from an inspectorate. It would be easier to enforce the law if the requirements concerning the contents of first-aid boxes were amended and brought into line with current medical practice. The existing regulations still call for the provision of iodine, an antiseptic which can be positively harmful, and sal volatile, which can seldom be of much use today when young women workers do not often suffer from either hysterical fainting fits or from corsets too tightly laced.

The casualty service provided by the local branch of a general hospital was adequate, in our opinion, to meet the needs of local industry. Managements knew of its existence, and, both in emergencies and for subsequent dressings, it was able to cope with the volume of casualty work in the locality. In this area, therefore, we agreed that there was no place for an additional industrial clinic and casualty service. In areas less well served by hospitals, however, the need might be great. Certainly, general practitioners, as at present organized, would not be able to deal adequately with these needs.

Theoretically, an appointed factory doctor responsible for conducting the routine examination of young workers and the periodic examination of some older employees, could have a considerable influence on the firms' ideas and attitudes concerning the health of their workers. In practice, however, we felt that this influence was not exercised in the very small firms. The appointed factory doctor seldom visited any of the small factories, and could not, therefore, get to know the employers or see for himself the conditions under which juveniles worked. Moreover, some employers were not referring their young workers for examination.

Turning from the therapeutic requirements of individuals to the needs of all workers for a healthy working environment, we saw many working in conditions which were sufficient to undermine any complacency. Although we saw some factories where conditions seemed entirely satisfactory, there were several instances where the term "slum factory" was not a misnomer.

The dirt and squalor which led us to describe a factory as a "slum" were often inevitable concomitants of the age and unsatisfactory nature of the premises. Even the most willing management with the best medical advice at its disposal would be fighting a losing battle in such circumstances. But the problem in these factories is aggravated, because it is often the small undertakings with narrow profit margins which occupy such premises.

In the worst cases, real improvement is almost impossible without rebuilding. In this sense, we were pleased that some of the small factories that we visited were shortly to be demolished as part of a slum clearance area. Many of these need to be in the neighbourhood of the larger factories which they often serve as subcontractors. In the area surveyed, for example, an electro-plating factory and a metal-working shop, amongst others, were engaged in subcontract work for other nearby firms. Rehousing them in the industrial areas of suburbs of new towns is, therefore, often impracticable unless the parent industry moves too. Even in this case domestic considerations might make the owners of

* New regulations, the First-Aid Boxes in Factories Order 1959, Statutory Instrument 1959 No. 906, have been published since this was written and will come into force on January 1, 1960.
small businesses reluctant to leave a district in which their families and those of their employees may have lived for generations.

In some areas, notably Birmingham and London, local authorities, recognizing the needs of small factories, have built large blocks of "flatted factories" or "unit workshops" in slum clearance areas. It is still too soon to say how successful they have been but it is clear that such schemes, even if successful, will take a long time to make much impression on the 200,000 small factories in the country.

While wholesale rehousing would form part of an optimum solution, much could be done to improve the working environment without such drastic measures. First, many of the deficiencies of the general environment could be remedied if managements could be cajoled into spending more money on cleaning and tidying, on heating, on the lighting of stairs and passageways, and on the provision of up-to-date lavatories and wash basins. Secondly, specific accident or disease hazards could be reduced or eliminated if both managements and men could be persuaded that their own interests would be best served by observing the safety regulations of the Factories Acts.

In the large firm, these objectives are often achieved because a firm with a reputation to maintain does not wish to risk a prosecution for failing to comply with the Factories Acts. Moreover, trade union representatives will exert some pressure, especially at a time of full employment. But managements in large firms have a further motive for taking steps to provide optimum working conditions—enlightened self-interest. Crudely stated, they are prepared to employ medical staff and technical advisers because they know that attention to the hazards of the working environment pays.

There is no doubt that industrial medical services covering small factories could accomplish much; but we consider it quite unrealistic in an area such as that which we surveyed to suppose that existing small managements would be prepared to join with neighbouring firms to introduce such a scheme. It is not only that small firms are much less sophisticated than their larger counterparts. It is also that existing industrial health services, whether run by companies themselves or on a local cooperative basis as at Slough and Harlow, have almost always grown from a preliminary recognition of the need for therapeutic services. Only when these were well established was it possible to extend the concept to cover indirect control of the health of the worker by control of his environment. In the area we surveyed, casualty work and treatment of minor ailments are already adequately covered by the special out-patient and casualty department of the local general hospital. We do not think it likely that firms, who consider that their needs are satisfactorily covered from this point of view, would rush into a venture of which the advantages are much less obvious.

In these circumstances, the only practicable way of securing radical improvements in the working environment seemed to us to be through an improved system of statutory inspection.

It is notorious that the number of factory inspectors throughout the country is still inadequate to ensure the regular inspection of all factory premises. Certainly, in the area surveyed, the district factory inspector had not been able to visit nearly half the firms within the last 12 months. The local authority health inspector had visited more firms to carry out his duties in respect of sanitation, canteens, and food handling.

It was our impression, however, that the functions and competence of the two types of inspector were often confused in the minds of many proprietors. In many respects the proprietor of the small firm is like the head of a domestic household, and his factory or workshop is often more akin to the home workroom than it is to the workshop of a large factory. It has been suggested that a plethora of social workers, all concerned to help or cajole a "problem" family into conformity, is likely to confuse rather than clarify matters for the family. We feel that it is legitimate to draw a parallel between this example from the domestic scene and the situation in the small factory. All the premises we visited were technically factories according to the law; but we were constantly aware of the continuum which exists from the wage earner exploiting a hobby in his spare time at home, through the family partnership, the individual with a few handpicked friends—all working directors—to the man who, by virtue of the one or two assistants he employs, is deemed to be running a factory. It was our impression that all these types of productive enterprise, only one of which is called a factory, have much more in common with each other than has the factory which employs less than a dozen workers with the factory employing a hundred or more.

If our impression is correct, it may be more fruitful to think in terms of a system of inspection which would be appropriate in the home rather than in the large factory. Above all, inspection for the small factory calls for simplicity. The small proprietor has often to be administrator, salesman, buyer, foreman, and worker all in one. For this reason he is the natural enemy of bureaucracy and unnecessary "paper work". If his relations with the statutory authorities could be conducted through
a single individual who could get to know the business and its problems well, there would be a much better chance of securing lasting improvements in the working environment and first-aid arrangements.

It would be premature on the basis of such a small survey to discuss how such an inspectorate could be formed. There are certain attractions about the view that the local health authorities’ inspectors, who already have statutory responsibility for sanitation and food handling, should discharge the duties of the Ministry of Labour Factory Inspector as well; but it could equally be argued that the factory inspectors’ skills could not quickly or readily be imparted to the health inspectors whose training is not primarily concerned with occupational hazards. There is, however, a strong case for suggesting that a fresh approach to the needs of workers in small factories is required.

Finally, it is our contention that, at a time when the extension of occupational health services and the development of occupational health laboratories are being planned, there is need for a great deal more information about the needs of small factories. Our own limited survey tends to confirm those findings of the Halifax Survey (1958) which were published. In both areas, there was ground for real concern about the adequacy of the safeguards for the health of the worker. If the best solution for the problems uncovered in such surveys is to be found, it is imperative that as much information as possible should reach the public. Only if the medical and lay publics are adequately informed can they contribute to the solution.

We would like to record our thanks to the Medical Officer of Health for the metropolitan borough in which the survey was done, and to those members of his staff whose assistance in the initial stages of our enquiry was most valuable. We would also like to thank the District Factory Inspector for the area concerned, and the managements of the 48 factories who generously answered our questions and allowed us to take photographs. The photographs in this report were taken by Drs. R. O. M. Jones, R. H. Strudwick, and E. C. Cummings.

REFERENCES


APPENDIX I

Medical Services for Small Factories

CONFIDENTIAL
Correct Answers should be ringed

1. No........................................ Date............../....../......
2. Observer............................................
3. Name of firm...........................................
4. Address ..............................................
5. Description ...........................................
7. Name of person interviewed..................
8. Position held........................................

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>18</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Clerical</td>
<td>18</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Foremen and Managers</td>
<td>18</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Total working on premises</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. pre-1918...
10. Year firm established in present premises

<table>
<thead>
<tr>
<th>Brick</th>
<th>Other (specify)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>11. Premises. Fabric</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. " Age
   pre-1918...
   1919-45...
   19 ___ 

    B. G. 1. 2. 3. 4+

14. " Original purpose
    Dwelling ....1 Shop .............2
    Outhouse ...3 Factory ...........4
    Warehouse ...5 Railway arch ....6
    Other (specify) ..................7

15. Dust and Fume Operations
    Paint spraying ................. Yes/No....1
    Metal buffing .................. Yes/No....2
    Sand blasting .................. Yes/No....3
    Electro-plating ................ Yes/No....4
    Degreasing tank ................ Yes/No....5
    Others (specify) ................ Yes/No....6
A SURVEY OF SMALL FACTORIES

16. **Chemicals Used**
   - Caustic acid/alkali: Yes/No...1
   - Carbon tetrachloride: Yes/No...2
   - Others (namely): Yes/No...3

17. **Machinery**
   - Circular saw: Yes/No...1
   - Guillotine: Yes/No...2
   - Drilling machine: Yes/No...3
   - Power press: Yes/No...4
   - Grinding wheel: Yes/No...5
   - Crane: Yes/No...6
   - Others (namely): Yes/No...7

18. **Protective Clothing Supplied**
   - Goggles: Yes/No...1
   - Gloves: Yes/No...2
   - Masks: Yes/No...3
   - Aprons: Yes/No...4
   - Boots: Yes/No...5
   - Others (namely): Yes/No...6

19. **Sanitation**
   - (a) No. of W.C.s
   - (b) No. of urinals
   - (c) No. of washbasins
   - (d) Supplied with: Yes/No...1
      - hot water?
      - soap?
      - towel?

20. **Medical Personnel available to firm**
   - Doctor: Yes/No...1
     - IF YES
       - Visits
         - Regularly: Yes/No...2
         - Irregularly: Yes/No...3
         - Never: Yes/No...4
       - Purpose
         - Accidents: Yes/No...5
         - Exam. new entrants: Yes/No...6
         - Routine exam.: Yes/No...7
         - Special exam.: Yes/No...8
         - Other (namely): Yes/No...9
     - Payment
       - Retaining fee: Yes/No...1
       - Service fee: Yes/No...E

21. **Nurse**
   - IF YES: Yes/No...1
     - Full-time: Yes/No...2
     - Part-time: Yes/No...3
     - (Hours per week): Yes/No...4
     - S.R.N. Assistant: Yes/No...5

22. **First-aider?**
   - IF YES: Trained? Yes/No...1
   - Nature of training: Yes/No...2
   - Approx. date: Yes/No...3
   - Position in firm: Yes/No...4

23. **First-aid equipment**
   - (a) Special room?: Yes/No.
   - (b) Couch?: Yes/No.
   - (c) Box?: Yes/No.
   - (d) If yes does it contain: Yes/No...1
      - antiseptic?
      - sterile dressing?

24. (a) Are aspirins available? Yes/No.
    (b) If yes are they frequently dispensed to employees? Yes/No.

25. Did you have any accidents during 1957 which entailed more than 3 days' absence? Yes/No.
    IF YES How many?
    What happened? Yes/No.
    Action taken.

26. What would you do if one of your employees cut himself badly?
    - Never thought about it.
    - Take to hospital.
    - Call ambulance.
    - Call local G.P.

27. Do you consider your present first-aid arrangements adequate for your needs, or would you like a doctor available for emergencies, or a nurse to do regular dressings?
    - Quite satisfied with present needs.
    - Would like doctor for emergencies.
    - Would like nurse for dressings.

28. (a) Have you got an accident book? Yes/No.
    (b) If Yes produced Yes/No.
    (c) How many entries were made during 1957? No.
    - What were the most common types of injury?

29. What would you do if you thought one of your employees had become ill as a result of his work?
    - Verbatim.

30. What would you do if you thought that some substance or machine you wanted to use might be dangerous to health?
    - Verbatim.

31. Would you consider consulting a doctor in such circumstances? Yes/No.
    - The factory inspector?

<table>
<thead>
<tr>
<th>Visits</th>
<th>Never</th>
<th>Visits in 1957</th>
<th>Purpose of Last Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2+</td>
</tr>
<tr>
<td>32. I.A. health (sanitary) inspector</td>
<td>X</td>
<td>Y</td>
<td>1</td>
</tr>
<tr>
<td>33. M.O.H.</td>
<td>X</td>
<td>Y</td>
<td>1</td>
</tr>
<tr>
<td>34. Factory inspector</td>
<td>X</td>
<td>Y</td>
<td>1</td>
</tr>
<tr>
<td>35. Appointed factory doctor</td>
<td>X</td>
<td>Y</td>
<td>1</td>
</tr>
<tr>
<td>36. Medical inspector factory</td>
<td>X</td>
<td>Y</td>
<td>1</td>
</tr>
<tr>
<td>37. Alkali inspector</td>
<td>X</td>
<td>Y</td>
<td>1</td>
</tr>
</tbody>
</table>

Enter only if reasonably sure of accurate information
Assessments

38. First Aid Equipment
   Inadequate .................... Yes/No.

39. Crowding
   Over-crowded .................. Yes/No.

40. Temperature
   Excessively hot ............... Yes/No.
   Excessively cold ............. Yes/No.

41. Lighting at work benches
   Inadequate ..................... Yes/No.

42. Lighting on stairs, etc.
   Inadequate ..................... Yes/No.

43. Noise
   Excessive ........................ Yes/No.

44. Cleanliness (general)
   Dirty ............................ Yes/No.

45. Cleanliness (W.C.)
   Dirty ............................ Yes/No.
   Factory No......................

46. Tidiness
   Very untidy ..................... Yes/No.
   General Impressions of Visit
   Hazard Notes, etc.

APPENDIX II

Classification of Industries in the Survey by Main Product or Activity

1. Chemicals and Allied Trades:
   Nil

2. Metal manufacture, Engineering, Shipbuilding, and Electrical Goods, Vehicles, Metal Goods not Elsewhere Specified
   Printing engineers Metal workers
   Spring makers Metal spinners
   Panel beaters Coach builders
   Radiator and car restorers Ball bearings makers
   Hospital equipment restorers Sign manufacturers
   Metal platers Screwmaker
   Radio parts Metal merchant
   Light engineering (2) Pen maker
   Electrical repairers Ball pen makers

3. Textiles, Leather, Leather Goods and Fur, Clothing
   Knitting Shoemaker
   Shirt maker Skirt maker
   Leather works (2)

4. Food, Drink, and Tobacco
   Fish curers Peanut roasters
   Imitation cream Potato merchant
   manufacturers

5. Precision Instruments, Jewellery, etc., Manufacturers of Wood and Cork
   Furniture maker (2) Wood merchant
   Optical manufacturers Piano manufacturer (2)
   Cabinet maker Piano parts manufacturer (2)
   Wood polisher

6. Others
   Wallpaper printers Artists' colourmen
   Toy makers Scrap and tyre depot
   Bus depot Printers
   Transport depot (2) Glass merchants
   Advertising depot
A Survey of Small Factories

Margot Jefferys and C. H. Wood

Br J Ind Med 1960 17: 10-24
doi: 10.1136/oem.17.1.10

Updated information and services can be found at:
http://oem.bmj.com/content/17/1/10

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/