cially exposed to the inhalation of dust from the clay in its manipulation, and we perhaps get a better apprehension of the effects of such inhalation from the statistics relatively to men and women engaged in the manufactories. For instance, we find that women engaged in fictile works furnished only 7.14 per cent. of the cases under notice, as against 36.57 per cent. of male potters so employed.

To turn now to the statistics of lead-disease among potters, male and female, I find that, among the 815 out-patients, as many as 68 suffered in one way and another from the baneful effects of the poison. In other words, one patient out of every twelve engaged in pottery manufacture suffered more or less severely from the poisonous effects in lead. This proportion is higher, indeed, than I should have stated had I been asked what it was; but the memoranda of the cases in my possession leave no doubt about the matter. The proportion is the more remarkable, inasmuch as the number of operatives brought into contact with lead constitute but a small percentage of the whole number of workers engaged in the pottery manufacture.

I must now say something about the disease induced among potters by the inhalation of dust. The special malady so induced is a chronic and incurable form of bronchitis, resembling in all its intrinsic features the bronchitis consequent on the inhalation of all mineral and of some organic dusts; resembling, that is, the "grinder's rot" of Sheffield, the miners' consumption of coal-getting districts, the consumption of dressers of stone, or that of the mother-of-pearl workers.

It is a form of bronchitis ever advancing from bad to worse while the workman continues at his calling. Pathologically, it is a fibrosis of the lung-tissue, consequent on the direct irritation of the gritty dust upon the mucous membrane of the smaller bronchi. Its minute features I have already described in a paper published in the *British and Foreign Medico-Chirurgical Review* for 1875, to which, in the absence of time to again depict them, I must on the present occasion refer my hearers. Its symptoms are distressing cough and severe dyspnoea, and, as frequent concomitants, heart-disease and dropsy. The marked dyspnoea causes it to be called potters' asthma, whilst the wasting accompanying it has given rise to the name potters' consumption. In fact, in many cases, the line of demarcation between this chronic bronchitis and tubercular consumption is difficult of recognition, and, in a large proportion of cases, tubercular disease is associated with it.

A few words with respect to lead-poisoning. This is witnessed in every variety of form and gravity, from mere general malaise and nerve-tremor and dyspepsia to more or less complete paralysis affecting one or more limbs, or even the whole body. Colic is the most frequent result, and is noted as the principal morbid feature in sixteen of the sixty-eight cases where lead was the morbid agent. Gastric and intestinal derangements, where colicky pain was not prominent, were found in fourteen instances. Paralysis of the hands and arms occurred in thirteen, hemiplegia and paraplegia severally in three, and paralysis of both upper and lower extremities in four cases. In not a few patients neuralgia was a leading symptom, affecting sometimes the aspects of rheumatism. Moreover, two of the sixty-eight patients were epileptic.

Usually I find colic to be the initiatory symptom of the lead-poisoning; but it is not by any means universally accompanied by constipation. It is also often intermittent between attacks of paralysis. The renal affection, with albuminuria, which some pathologists insist upon as a common resultant of lead-poisoning, has very seldom indeed fallen under my observation, although I have carefully looked for it. Affection of the sight, amounting to actual blindness in rare instances, is of common occurrence; and, among the women, menstrual disorder, miscarriages, and confinements with puny children, unable to survive, are events of considerable frequency, attributable to the operation of the same mineral poison.

A word, in conclusion, relative to the maladies prevailing among the workpeople, chiefly women, engaged in the "finishing" departments. These are such as are credited to working in hot, ill-ventilated, and too crowded shops, and in constrained and fixed positions, and also to sedentary work. The women suffer with delayed and disordered menstruation, especially with amenorrhoea and its concomitants anæmia and gastric disorders, and also with pulmonary consumption. Epilepsy is a very common malady among both men and women, and chorea even a more frequent one among the girls and children. Gout also prevails largely in the female population, making its appearance at or soon after puberty; but it is not unknown, though uncommon, among the males.

The time at my disposal is too short to give you other than a very rude outline of the subject I have taken in hand; but the matter presented to you may suffice to enable you to form some conception of the sanitary, or rather insanitary, conditions under which the pottery artisans labour, and of the maladies thereto attributable. As a matter of

course, I have said nothing about the hygienic or sanitary measures calculated to lessen or remove those unfavourable conditions, deeming this topic, even had time allowed me, beyond the scope of a paper read before this Section of Medicine.

ON THE OCCURRENCE OF PHTHISIS AMONG GRANITE-MASONS.*

By R. BEVERIDGE, M.D., Aberdeen,
Physician to the Royal Infirmary.

FROM the similarity in several points between the working of granite and other trades known to be unhealthy, I was led, some years ago, to inquire into the sanitary condition of the granite masons in this neighbourhood; but the results obtained were mainly negative. The repeated occurrence, however, of late years of phthisis among masons, as brought under my notice in hospital practice, induced me to look into the subject again, with the following result:—That the granite masons were formerly a very healthy body of men, little subject to phthisis; but that, of late years, although they are still fairly healthy, yet phthisis is much more prevalent among them than it was. The following figures will make this apparent. As I desire to compare the past fifteen years or thereabout with a period prior to 1850—before the Registration Act was in force—a reference to the Registrar's returns of deaths will not avail for my purpose; and I, therefore, take the admissions into hospital as the most reliable source of evidence for the purpose of comparison. These admissions do not, of course, give the total number of cases in town, but a comparison of the ratio of phthisis to other diseases among the masons admitted to hospital will give a very fair approximation to the prevalence or otherwise of that disease at different times. For a reason that will be apparent immediately, I select the ten years 1839 to 1848, inclusive, as representing the former condition of the trade, and, during that period, the ratio of phthisis to other diseases among the masons admitted was as 1 to 77½. The ten years succeeding to the period named must be held as exceptional among the working population of Aberdeen, for this reason. The financial crisis of 1847-48 fell with very great severity on Aberdeen, paralysing its industries to such an extent, that the working population shortly began to leave the town in considerable numbers, and continued to do so for several years. So long, in fact, did the depression continue, that the census of 1861 showed but a trifling increase over that of 1851: an increase not equal to the natural increment by excess of births over deaths. The ten years, therefore, 1849 to 1858, I leave out of account, as the condition of the working classes then was such as to make it unsafe to draw any conclusion as to their sanitary state. During the next decade, 1859 to 1868, the ratio of phthisis to other diseases among the masons admitted to hospital was as 1 to 26, or about three times the proportion already quoted. In the succeeding seven years, 1869-75, the same ratio is maintained, with this circumstance in addition, that the total number for these seven years is as large as for the previous ten. This naturally raises the question, Is this increase exceptional in this trade, or is it but the expression of a general increase dependent on the increase of the population, or a defective sanitary condition of the town at large? This question I answer from two sources: 1. The total hospital admissions of phthisis; 2. The Registrar's returns of deaths from phthisis. In stating these, I take an average of years; for it is obviously unfair in such a disease as phthisis, which varies to a certain extent, both in incidence and in mortality, according to the seasons, to take any single year as a guide. For the ten years 1859-68, the average annual admissions of phthisis cases was 73, and for the seven years 1869-75, the average was 70. Phthisis, therefore, throughout the town was, to say the least, not on the increase. The Registrar's returns of deaths from phthisis shows the same result. For the seven years of which 1861 was the centre, the average annual mortality from phthisis was 228, or one in every 323.7 of the population; while, in the seven years of which 1871 is the centre, the average was 229, or one in every 354.8 of the population. It appears, therefore, that, throughout the town generally, the total number of cases of phthisis is not on the increase, although the population is rapidly rising; or, in other words, that the proportion of phthisis to the population at large is on the decrease, while, among the granite-masons, it is on the increase. The same result may be brought out another way. If we compare the number of masons admitted labouring under phthisis with the total admissions into hospital of cases labouring under the same disease, the following result appears. From

* Read before the Medical Section at the Annual Meeting of the British Medical Association in Sheffield, August 1876.

1839 to 1848, the proportion of masons affected with phthisis to the total number of phthisis cases is as 1 to 71; from 1859 to 1868, the ratio of the same is as 1 to 56.5; and from 1869 to 1875 as 1 to 37. If it be objected that the total admissions are of too miscellaneous a character to afford a fair comparison, then we may restrict it to the factory operatives, and compare the number of phthisis cases in these two classes, when the figures stand thus:—The ratio of phthisis cases among masons to that of phthisis cases among factory hands during the ten years 1839–48, is as 1 to 19; during the ten years 1859–68 as 1 to 10; and during the seven years 1869–75 as 1 to 9. The proportion of masons to factory operatives in the town has ranged from 1 to 6 to 1 to 7; so that it would appear that, while the liability to phthisis among masons has nearly doubled within the last thirty years, it is not even yet so great as it is among the bulk of the working population in the town.

Such a result presents us with two problems to solve: 1. Why should granite working be an exceptionally healthy occupation? 2. Why should its character in this respect have so far changed?

One has only to look into a mason's shed to see that the occupation is a very dusty one. A glance shows the presence, particularly at the upper part of the shed, of a faint whitish cloud, while the fine gritty white dust that settles on every thing shows plainly enough the results of the workman's labour. Why should the fine gritty dust be so innocuous in this case, when similar dust does so much harm in other trades? The explanation seems to lie in the conditions under which the work is carried on. The mason works, for the most part, in long narrow sheds, completely open on one side; near this open side, he places the stone, and works with his face towards the light and air, and stooping, to a certain extent, over his work. He is, therefore, practically in the open air, the shed serving simply to protect him from wet; the dust is almost entirely above and behind him; while the muscular exertion necessary to wield his heavy tools is such as to keep him sufficiently warm to resist variations of external temperature.

I have inquired into the conditions of the trade with the view of determining the cause of its sanitary deterioration, and, in particular, I have endeavoured to ascertain whether the recent great development of the trade in polished granite might not have been in part the cause. I have failed, however, in tracing any part of it to this; the work of the mason is practically unchanged, and the polishing which is added to his work after his part is finished is effected entirely by machinery, and in that part of the work there seems nothing calculated to be injurious. The change seems to be mainly due to a change in the class of men engaged in the trade. For some time, and especially within the last five or ten years, there has been a great emigration of masons from Aberdeen. The high wages current in this trade in America has had the effect of draining it largely of its best hands, and the result is that the greater part of the flower of the trade has left the country. Their place has been largely taken by a class of young lads inferior in physical strength to their predecessors, and, therefore, unable to resist the exposure necessary to keep the work from being positively injurious. Formerly, the trade was largely recruited by stout, robust, healthy lads from the country; but this class is now becoming very scarce from various causes connected with the occupancy of the land, and weaker town-bred lads are taking their place. In short, the country labourer is being driven away by the concentration of land in a few hands, and the mason is being enticed away by high wages elsewhere, so that the *physique* of the trade is being changed, and a decided deterioration is the result.

DISEASES AFFECTING LEAD-WORKERS.*

By W. HOLDER, M.R.C.S.Eng., L.S.A.Lond.,
Surgeon to the Hull and Sulcoates Dispensary.

A PARAGRAPH in our JOURNAL intimating that it was intended to have a series of papers read on the diseases incidental to trades, brought vividly before me recollections of several cases of lead-poisoning which have been at times under my care during the last few years, more especially recalled to my mind two cases of the gravest nature, and determined me to try to attract the attention of the members at this gathering for a few moments to a trade disease, which, in my opinion, affects as seriously the human frame as any to which your attention may be directed—I refer to the manufacture and uses in trade of white-lead for paint. I am not unconscious in giving such an opinion of the destructive nature of diseases instigated and upheld by the inhalation of the grit and grinding which impregnate the atmosphere where cer-

tain trades are conducted; but, remembering this, and the horrors suffered by the *employés* in the phosphorus manufactures, I feel justified, after calm consideration and observation, in saying that lead-poisoning is one of the most baneful of them all; for it is not so merciful in its speedy destruction, its tortures are agonising and prolonged, and the lingering cachexia induced renders life useless and a burden to the sufferers frequently to the end of their miserable days. It should be understood that I refer, in this paper, not alone to the slight absorption of lead by the plumbers and painters, but chiefly (I may say almost absolutely) am particularising the ingestion of lead from the inhalations of carbonate of lead-powder in the whitelead manufactures, where sheets of lead are acted upon by the fumes of acetic acid and spent tan, which, corroding the metal, gradually convert the lead into a heavy white powder of carbonate and deutoxide of lead, which, when mixed with oil, is used as a paint and called whitelead. In the manufacture, manipulating, and packing of this substance, not only does the air breathed become impregnated by the deadly agent, but, the hands being in constant contact with it, it becomes absorbed also through the skin.

The labourers in these manufactories show truly the terrors of the trade: as may be imagined, only the poor and ignorant will work in this avocation; either their sense is so blunted by want or indifference, that they accept labour which is too sure to curse them, and to which, did we put our criminals, I venture to say we should quickly receive, and justly merit, the hearty condemnation of the whole civilised world, as Russia does for the political prisoners in her Siberian copper-mines. It is work such as is described by a writer as—

“Bare life he toils for here all day,
Surrounded by a dirty gray;
Bare life, all bare of joy.”

To those who have seen but cases of painter's colic and wrist-drop, although so formidable and grave, my criticism of lead-poisoning may seem too harsh, but, to those who have practised amongst these lead-workers, as I have done, I can confidently look for confirmation of my remarks. I need but recount two extreme examples from many cases as justification in themselves of what I have said. In December 1874, Bridget M., aged 27, a strong fresh-coloured Irish girl, came under my notice for treatment. She had been working at the lead-mills for only five weeks; she was suffering from severe colic, with constipation; this was relieved after a few days' suffering. She went again to her work, and, in about a fortnight, she returned to me with much more persistent colic, faintings, and constipation of the bowels. She was again relieved, strongly advised to be scrupulously clean and to drink plenty of the diluted acids prepared for them at the works. I saw her after this several times; after about seven months, the cumulative action of the lead produced paralysis, which gradually completely affected the left side of the body. When I again saw her, she was thus paralysed; the face was pinched and wasted; she was intensely anæmic: her hearing was much affected. From her appearance, she would then have been taken for nearly double her age; her suffering from colic was dreadful in its intensity; it came on intermittently, and resisted for some weeks treatment to cure it. When I last saw her, some months after I had given up treating her, the paralysis was in no way improved; the deafness was complete on the left side, hearing dull on the right; her teeth were rotting away; and, for all pleasures and purposes of life, she was blighted. I have lost sight of her for some time past, and could not find her before leaving home.

The second case was that of Margaret J., aged 38. This woman came repeatedly under my care. She had had many attacks of colic and constipation, for which she had been treated at the hospital; but her poverty (for their wages are small) barely allowed her to become relieved before she again returned to her work. At length, the constipation, pain, and weakness completely prostrated her; she was then compelled to seek medical aid at home. After I had again relieved her, and warned her of the consequences (her very cachexia seemed to be against her obtaining better employment), she returned to her former work. When I was next called to her, her condition was indeed pitiable; there was a transparent waxy-looking skin (which, in the women, I may say at first gives them a most beautiful transparent complexion); she had wrist-drop on the right side, which gradually spread up the arm to complete paralysis of the extensors; her lips were pallid; her eye bright and pupils dilated; she complained of her sight being dim; her forehead was covered with heavy beads of sweat; the bowels were aching and constipated; of course, she had the usual blue line on the gums, the teeth shaking in the sockets, covered with an ashy-grey slime; the breath was nauseous to the woman and horrible to all in the room with her. On my calling next morning, the aching bowels were still constipated and spasms heavy; a few days after, her sight became worse, and ultimately she became blind from amaurosis, for

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