

The essentials of a healthy dwelling, and the extension of its benefits to the labouring population : with a special reference to the promotion of that object by H.R.H the late Prince Consort / by Henry Roberts.

Contributors

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THE
ESSENTIALS OF A HEALTHY DWELLING,
AND THE
EXTENSION OF ITS BENEFITS TO THE
LABOURING POPULATION.

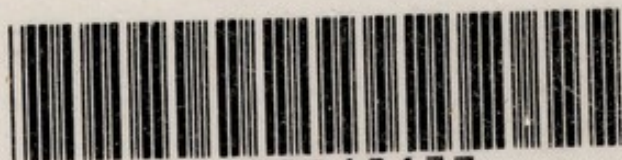
WITH
A SPECIAL REFERENCE TO
THE PROMOTION OF THAT OBJECT
BY
H.R.H. THE LATE PRINCE CONSORT.

BY
HENRY ROBERTS, F.S.A.
FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS;
HONORARY MEMBER OF THE ACADEMY OF FINE ARTS IN FLORENCE,
ETC.

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PREFACE.

THE following paper, although primarily addressed to a scientific body, was written with a view of diffusing more widely useful practical information, as well as of stimulating to increased efforts for the accomplishment of its much-needed object.

Whilst passing through the press, the announcement has been made of an unprecedented act of munificence on the part of an American merchant resident in London. In order "to ameliorate the condition and augment the comfort of the poor, who form a recognised portion of its population," George Peabody, Esq., has placed 150,000*l.* in the hands of Trustees, with the suggestion "to apply the fund, or a portion of it, in the construction of such improved dwellings for the poor as may combine, in the utmost possible degree, the essentials of healthfulness, comfort, social enjoyment, and economy."

The writer, in personal intercourse with a much-esteemed Ambassador from the same country—the late Mr. Abbott Lawrence—learnt the great interest he felt in this object, and which was afterwards manifested by a bequest of 50,000 dollars, for the building of model houses in Boston, U.S.

Both these funds, so administered as to avoid the evils which generally result from eleemosynary assistance, may doubtless be made the means of imparting, to an almost incalculable extent, the benefits intended by their philanthropic donors.

Whilst such examples encourage greatly the efforts made for placing this subject prominently before the public, the Author of the following pages, aware of some of the benefits which have resulted from those made in 1851, desires again to take advantage, as far as may be in his power, of the opportunities presented for that purpose at the concourse of persons attracted from all parts of the globe by the approaching Exhibition.

To those, more particularly, who will take a part in the meetings of the National Association for the Advancement of Social Science, and of the Congr s International de Bienfaisance, to be held conjointly in the Metropolis, the Author inscribes the following pages, as to fellow-labourers in the field of social improvement.

ATHENÆUM CLUB,

PALL MALL, *April*, 1862.

PREFACE

The following paper, although primarily addressed to a scientific body, was written with a view of affording more widely useful practical information as well as of stimulating to increased efforts for the accomplishment of its much-needed object.

Whilst passing through the press, the announcement has been made of an important and not unimportant on the part of an American merchant resident in London. In order to appreciate the conditions and extend the number of the persons who form a recognized portion of the population, George F. Peck, Esq., has placed 150,000 in the hands of London with the suggestion to apply the fund or a portion of it in the direction of such improved facilities for the sale of any commodity in the United Kingdom, where the quantity of merchandise, constant, local, foreign, and general.

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Both these funds, which were established for the benefit of the poor, have been generally well known, and have been made the means of important and useful endeavours. The former, intended by the late Mr. Peck, Esq., for the relief of the poor, has been already mentioned in the Author's preface to the first edition of the book, which has been published in 1851, and which has been the subject of a report presented for the consideration of the Committee of the House of Commons, and which has been the subject of a report presented for the consideration of the Committee of the House of Commons, and which has been the subject of a report presented for the consideration of the Committee of the House of Commons.

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THE
ESSENTIALS OF A HEALTHY DWELLING
AND THE
EXTENSION OF ITS BENEFITS TO THE
LABOURING POPULATION.

READ AT
THE ROYAL INSTITUTE OF BRITISH ARCHITECTS,
20th January, 1862.

IN acceding to the request of the Institute that I would, after an interval of twelve years, again give to its members some of the results of that experience which has been gained in my gratuitous efforts to promote the healthfulness of our dwellings, and more especially those of the labouring population, I feel that, however unattractive the subject may be in an artistic point of view, it has some peculiar claims on your attention, and that whilst many of the difficulties with which it is beset can be appreciated, their solution may probably be aided by some amongst those I have now the pleasure of addressing.

In my paper read the 21st January, 1850,* reference was made to the great interest taken in this subject by our late illustrious patron, the deeply lamented Prince Consort, and his Royal Highness's own words were quoted, to show that "these feelings are entirely and warmly shared by Her Majesty the Queen," our most gracious patroness. Proofs of an undiminished continuance of that interest, as well as some of its practical results, will be stated in the second part of my present paper.

It would be doing violence to your feelings as well as to my own were this allusion to be unaccompanied by an expression of the most profound sympathy with our beloved Sovereign, for whom we earnestly pray that in this time of overwhelming grief abundant consolation may be granted from above. Shall we not also indulge the hope that the gradual development of the great and wide-spread

* This paper was published, with numerous illustrative plates, by the Society for Improving the Condition of the Labouring Classes in 1850, under the title of "The Dwellings of the Labouring Classes, their Arrangement and Construction;" and it has, in a French translation, made by order of the Emperor when President of the Republic, been widely circulated in France. Considerable portions of it have also been published in Germany and in the States of North America. The third edition, 5th thousand, contains much supplementary matter.

benefits resulting from the noble principles, highly practical wisdom, and bright example, which, alas ! we must now speak of as a precious legacy left by his Royal Highness for the good of his family, his adopted country, and the world at large, will have a soothing influence on our bereaved Queen, as well as stimulate many to follow so bright an example ?

In the grief so universally manifested at the death of this great and good Prince we all participate ; but those who were honoured by occasional intercourse with that illustrious person, and knew his kindly, courteous manner, must feel the loss more deeply. Some present can, no doubt, bear witness with me to the proof of real interest in the objects his Royal Highness deemed worthy of his attention, which was manifested by a remarkable appreciation of minute details—a characteristic feature, if it be permitted me to say so, of a mind as reflective as it was highly cultivated.

A suggestive motto, suited to the subject before us, might be easily selected, from one of the admirable addresses by his late Royal Highness, which it was my privilege to hear at the Aberdeen meeting of the British Association, and at the International Statistical Congress, held more recently in London ; but I prefer adopting for that purpose a sentence uttered on another occasion by the ever to be lamented Prince, on account of the deep feeling of responsibility which it manifests, and the important principles so peculiarly applicable to my subject. It is the following :—

“The blessings bestowed on us by the Almighty can only be realized in proportion to the help which we are prepared to render to each other.”

In proceeding to point out the circumstances conducive to the healthfulness of a dwelling, some will be named which cannot be strictly termed “ essentials,” inasmuch as their absence may be compensated for. Such is the case where localities, though not elevated, have a good soil and are well drained. It may, perhaps, appear scarcely necessary to add that the healthy state of a dwelling will not be ensured by any one, or even by the union of several of the features essential thereto, in the absence of others which are of equal importance.

The condition of “ healthy,” in regard to dwellings, arises out of a combination of circumstances, which comprise—

1. Those appertaining to the locality, including a free circulation of pure air, a good soil, an efficient drainage, an ample supply of pure water, and a genial aspect.
2. Those which are structural.
3. Those which depend mainly, though not wholly, on the occupants themselves—external and internal cleanliness, and a proper use of structural arrangements.

Firstly.—IN REGARD TO LOCALITY. High and dry situations, having a free circulation of air, whether occupied by groups of buildings, as in towns, or by isolated dwellings, as in the country,

are proverbially healthy ; whilst those which are low and damp, or surrounded by confined air, are the opposite. Experience, afforded by the state of troops when encamped, or when in permanent barracks, or in hospitals, is conclusive on this point. It is a known fact that the mortality of troops in Jamaica has been diminished from 120 to 20 per thousand by their removal from the plains to the hills ; and it is well ascertained that ague, dysentery, and fever prevail in localities where the surface of the ground is naturally wet and insufficiently drained, or where there exists an accumulation of decaying matter, of which one sure indication is the presence of an abundance of flies. Dampness of situation is also productive of mental depression and bodily feebleness, which excite a craving for intoxicating drink. The embosoming in trees, or any other obstruction to a free circulation of air immediately round a dwelling, is prejudicial to health, and should, therefore, be avoided.

A soil of gravel is unquestionably the most healthy, and, next to it, one of sand. A soil of chalk is usually attended with the disadvantage of its being necessary to sink a considerable depth for water ; whilst the chemical properties,* imbibed in the process of filtration, are injurious to some constitutions. Tanks, or reservoirs for storing rain-water are, in such cases, often the most suitable expedient. Clay soil, which, from its non-porous nature, retains the rainfall, is a frequent cause of the dampness so prevalent in the lower stories of houses in many localities—an evil felt as much in some which are elevated as in those at a lower level, and a fruitful source of sickness amongst servants, as well as the occupants of small houses, whether in towns or in the country. The precautionary measures which should be adopted when the soil is of clay will be noticed under the head of construction.

Loose soil close to a house is a frequent cause of damp, which might be remedied by a flagging of stone or asphalte, and in many situations a dry drain or area ought to be formed round the building. Care should, therefore, be bestowed in regard to the surface of the ground about a dwelling, as well as in the selection of its site.

Drainage of the Soil and Surface.—Wherever dwellings are built on naturally wet ground, it is essential to their being healthy that ample provision be made for draining the soil, as well as for ordinary surface drainage and for the carrying off of surplus fluid from the house itself. The necessity for this description of drainage is generally more manifest in the country than in towns, their gradual formation and progressive increase having been

* A process for softening water derived from chalk has been put in operation at Woolwich, and is said to be successful. In an article on sanitary legislation in England in the *British Almanac* for 1859, this process is noticed, and also the serious inconvenience often occurring from the oxidation of iron pipes used for soft water supplies, the only known effectual remedy for which is an internal coating, or varnish.

usually accompanied with surface drainage under some form or other. Good surface drainage is, however, peculiarly necessary in towns built on an uneven surface, as is the case with the metropolis, which stands on low hills in the midst of an imperfectly reclaimed swamp, partially underlaid by a stratum of peat. The lower levels on either side of the Thames, where the drainage has been most inefficient, were much more severely visited by the cholera than the higher parts of the metropolis.*

House Drainage.—The providing efficient means for house drainage, as well as a good surface drainage, is a duty which, in the case of towns, obviously devolves on the public authorities. The consequences of a past neglect of this duty have been remarkably manifested at Windsor, where the prevalence of fevers and choleraic complaints having led to an investigation, the drainage of the town was found to be very defective, and without any proper ventilation to carry off the gases which form in the sewers; whilst, on the contrary, at the Castle,† a separate and perfect system of drainage having been provided, no disease existed. The case of Bedford might be cited as another instance recently before the public. House drainage should, as far as possible, be kept without the building, although the valuable modern improvement of glazed earthenware tubes with perfect sockets has greatly diminished the risk of leakage from defective drains, an evil formerly so prevalent. Especial care ought to be taken that the pipes which discharge into them are properly trapped, in order that they may not become a medium for the escape of foul air into the dwelling. It may be useful to point out the disinfecting properties of wood charcoal, now successfully applied as a medium of filtration in ventilating sewers, house drains, &c.

Cesspools under basement floors, so common formerly, have been the cause of sickness and deaths innumerable. During the cholera in 1849, to my knowledge, several cases wholly traceable to this cause occurred in one house. Whenever these latent sources of mischief are discovered, they should be removed as quickly as possible. In many houses of the first magnitude, both in the metropolis and in the country, which are not of recent construction, this evil exists, as well as that of defective drains, causing the ground under the house to become sodden with foetid matter. The gases which originate in these places, and diffuse themselves

* I have the authority of Dr. Farr for stating that, if the mean of cholera epidemic of 1848 and 1854 in London be taken, nearly 11 per 1000 of those living under 10 feet of elevation died, to 1 per 1000 of those at the highest elevation; and that if London be divided into terraces of different degrees of elevation, the mortality from an epidemic of cholera is, in round numbers, inversely as the elevation.

† The official Report made by Mr. Rawlinson, since the reading of this paper, entirely confirms the fact here stated. The perfection referred to is attributable to the thoughtful care of the lamented Prince Consort.

over the dwelling, constitute one of those conditions of local impurity which exercise a powerful influence when the state of the atmosphere is favourable to an outbreak or spread of cholera, fever, or other kindred complaints. The abolition of cesspools within all dwellings is therefore a sanitary measure of the first importance.

Pure Water.—For an ample supply of pure water, one of the most important accessories to a healthy dwelling, the public authorities should, in the case of towns, be held responsible. The contamination of our rivers by their being unscrupulously, and at the same time most wastefully, made the receptacles of sewage, has rendered them very generally incapable of supplying the neighbouring population with pure water. Fully admitting the improvement which, in respect to its supply of water, has taken place in our own metropolis, it still remains far behind the metropolis of the Roman Empire, and even many of its provincial cities. Those who have traversed the Campagna di Roma can never forget the gigantic aqueducts whose ruins proclaim how abundantly and at what cost Rome was supplied with water. The water from Loch Katrine recently brought to Glasgow, at a cost of 1,500,000*l.*, contains only 2·35 grains of impurity per gallon, whilst the water supplied to London by six of the leading companies is shown, by late official returns, to contain from 17·72 to 21·76 grains. The practice which has to such an extent prevailed in our towns of obtaining water from *wells*, sunk not unfrequently near to a churchyard, has been very prejudicial to health, though its sparkling appearance and freshness to the taste might lead to the contrary supposition. Its impurity is generally caused by an infiltration from some neighbouring drain, cesspool, or other deposit of putrefying matter. Many such instances in the metropolis might be referred to. One was recently mentioned to me by the medical officer to the General Post Office as having been the cause of much internal derangement to several of the *employés* in that establishment, and which had led to his recommending the use of the patent carbon filter. In late reports of the Registrar-General reference is made to a well at Sandgate as containing 40·96 grains of impurity per gallon; and in another at Hampstead as containing 53·60 grains.

For dwellings in the country good drainage and ready access to pure water are not less essential than they are in towns, and they ought, therefore, to be made the subject of deliberate investigation before the locality of a dwelling is decided on.

The aspect of dwellings is often greatly dependent on local circumstances, and has an influence on their salubrity which is too much overlooked. In preference to all others, a southern aspect should be chosen, and where that is unobtainable, one inclining either to the east or to the west, so that the rays of the sun may enter at some part of the day. Rooms to be chiefly occupied in the height of the summer are exceptional, though in such cases I should give the preference to an eastern or a north-eastern over a

due northern aspect. In towns the difficulty of obtaining a sunny frontage may frequently be great, if not insurmountable, but the importance of having the sun's rays within the dwelling for some portion of the day, especially in rooms occupied by children or by invalids, should never be forgotten. I could point to a large convalescent asylum in the country which is so arranged that the spacious gallery used by the patients for exercise during the greater part of the day is without the cheering and warming rays of the sun. Such defects tend to defeat the main object of the institution, and are a discredit to all concerned in the building.

Secondly.—THE STRUCTURAL FEATURES essential to a healthy dwelling have now to be considered. In pointing them out I shall aim at the same brevity which has characterized my remarks on those appertaining to locality; and not doubting that your own recollections will supply the corroborative passages which might be adduced from Vitruvius, from Alberti, and other eminent authorities, I abstain from quoting them, in order to avoid unnecessarily encroaching on your time and patience.

To secure the healthy condition of a dwelling its structure must be—1. Dry. 2. Warm. 3. The number and area of its apartments must be in proportion to the number of their occupants, and due provision must be made for all the requisites appertaining to daily life. 4. It must be well lighted. 5. It must be properly ventilated, and be free from noxious vapours of every kind.

1. In order to a house being dry, it must stand on a dry *foundation*; and where this is not otherwise obtainable, artificial means should be adopted, either by forming a stratum of concrete, varying in depth according to circumstances, but never less than 12 inches;—by a bedding of slate in cement, or by a bed of asphalte laid through the whole thickness of the wall under the floor level.

The lowest or *basement floor* should be raised not less than about 8 inches above the external surface, and if the floors are of wood, the ground beneath them ought to be excavated, so as to give a clear depth of not less than 12 inches, which should be ventilated by means of air bricks, built in the external walls.

Floors of stone or of slate should either be hollow, resting on brick courses, or be laid on a dry bed, prepared for the purpose, which is also essential in the case of brick or tile floors. In some parts of the country lime and sand floors are pretty generally used for cottages, and when properly made with a dry substratum are said to last upwards of 40 years. I have used Portland cement for the floors of living rooms in fireproof dwellings, but in those places where there is much wear stone is preferable. Bed-rooms ought, in our climate, when not matted or carpeted, to have boarded floors.

External walls must be weather proof, of sufficient thickness to

secure dryness and warmth. On the facilities for obtaining a good and non-porous material may depend whether brick, stone, or flint be used; whichsoever it be, good mortar is essential to dryness. In some places concrete, pisé or cob, with an external facing of plaster, or rough cast, may be employed with advantage, provided the foundation be dry, and the walls are well protected by an overhanging roof. Hollow walls conduce greatly to dryness and warmth; they may be formed either wholly of brick, or externally of one of the other materials before named, and be lined with brick or tile, a small hollow space being left between. The same advantages are derivable from the use of hollow bricks, and they are also well adapted for the lining of walls. A glazing on the external surface of brickwork is an effectual preventive of damp, and it is to be regretted that suitably glazed bricks are not easily obtainable at a moderate price. Their smooth surface is a great recommendation for some internal work, on account of its cleanliness and its non-retaining properties of noxious odours. Colouring or whitewash is more healthful than paper in common apartments, and should be frequently renewed.

For the *covering of roofs*, slate has with us so many recommendations that its general adoption may be readily accounted for; the evils attendant on its use, arising from changes in the temperature, should be particularly guarded against by boarding, by felt, or by double plastering. Tiles are generally found to be warmer in the winter and cooler in the summer than slate, and requiring less lead are in that respect more economical. Projecting eaves should invariably have gutters, to prevent the drip which is often the cause of damp in the walls and foundations; the same evil too frequently arises from a stoppage of the rain-water pipes consequent on their being either too small, or their heads being unprotected from the intrusion of birds' nests, leaves, &c.

For the roofs of town buildings more particularly, a fire-proof construction,* such as was described in my paper of 21st January, 1850, has many obvious advantages to recommend its general adoption. But the practice, so extensively prevalent, of forming rooms for servants in the roof has an opposite tendency. In reference to *fire-proof constructions* I would take this opportunity of recalling a suggestion in a Paper read by my friend Mr. S. Smirke, 5th November, 1860, "On the Use of Coke," which, from its lightness

* I adopted the hollow-brick fire-proof construction here referred to, in the roof and floors of the two ranges of model dwellings for families built in Streatham-street, Bloomsbury, and in Portpool-lane, as well as in the lamented Prince Consort's model houses at the Exhibition of 1851. Recently the efficacy of this mode of construction was tested at the Streatham-street houses, by a tenant who accidentally set fire to the woodwork of his apartment, to which the fire was limited. Hollow bricks, with wrought-iron girders, are now very extensively used for floors in Paris. Thirty years since, when constructing Fishmongers' Hall, I used, over the kitchen and in some other places, a vaulting of earthen pots, hollow bricks being then scarcely known, though they have been found in the remains of Roman buildings in this and other countries.

appears to be equally suitable for the purpose of vaulting, as the volcanic scoria or pumice known to have been thus applied in many important buildings in Italy and Sicily.

When the immense destruction of property caused by fire, and too often accompanied by the loss of life, is considered, the question of an efficient system of fire-proof construction generally applicable, appears to me to merit the very serious consideration of the Institute of British Architects, and I therefore venture this passing remark, though the suggestion is not immediately connected with my subject.

Wood of an inferior quality, or unseasoned, when used in any part of a dwelling-house is a false economy, whilst the cracks and shrinkages caused thereby are, from the draught they occasion, often prejudicial to health.

Lead, a material which enters into the construction of most dwellings, should be used with great caution for pipes which convey drinking water, and ought to be dispensed with altogether for cisterns, excepting those for the service of closets, on account of the injurious effects produced by the chemical action which frequently takes place when the water in them is soft. Iron, properly varnished or enamelled, may be substituted for both purposes; and for cisterns, slate is very suitable. The offensive and unwholesome smell which often proceeds from sinks of lead or ordinary stone, renders the substitution either of slate, of glazed stone-ware, or of enamelled iron, very desirable.

2. *Warmth*.—This in a dwelling depends, not only on its aspect, its dryness, the materials used, their proper application and substance, as I have already noticed, but also on the structural plan, particularly on the relative position of the doors and fireplaces, as well as of the windows and spaces for beds, which should be so contrived that the occupants will not be exposed to draughts.

With all our regard for comfort, it is surprising that we do not more frequently endeavour to modify the effects of our variable climate by the use of double sashes, which are so common in many parts of the Continent. This would be a means of retaining more of the small portion of genial warmth which passes into the room from our wastefully constructed open fireplaces, a subject on which, in connexion with the artificial warming and ventilation of dwellings, something more will be said hereafter.

3. *The number and dimensions of the apartments* essential to health in a dwelling, must be proportionate to the number of its occupants, and suitable provision must be made for all that appertains to a well ordered domiciliary life, not only that of the master and mistress as well as of the children, but also that of the servants, whose health and morals it is the duty of their employers to care for.

The amount of space required for health being greatly dependent on efficient ventilation, it will be considered under that head. In most dwellings the scale of accommodation chiefly depends on the

means and circumstances of the occupants, in which the variety is so great that I shall not attempt giving anything but a brief outline of what may be termed the minimum provision which ought to be made for a family consisting of parents and children of both sexes, belonging to the labouring class, undoubtedly the most numerous section of the community.

A *labourer's dwelling* in the country should have a small entrance lobby, a living room not less than 150 feet in area, and a scullery of from 60 feet to 80 feet in area, in which there should be a stove or fireplace for use in summer, as well as a copper and sink; there should also be a small pantry. Above should be a parents' bedroom of not less than 100 feet area, and two sleeping-rooms for the children averaging from 70 to 80 feet superficial each, with a distinct and independent access. Two of the sleeping-rooms at least should have fireplaces. There ought also to be a properly lighted, ventilated, and drained closet, as well as suitable enclosed receptacles for fuel and dust. The height of the rooms, in order to their being healthy, should be scarcely less than 8 feet, and even 9 feet would be desirable but for the extra expense. With a view to ventilation, the windows should reach nearly to the ceiling, and the top be invariably made to open. In windows which have transoms as well as mullions, some of the upper compartments may be hung on centres for this purpose.

It may be deemed almost Utopian to indulge the hope of seeing such accommodation as this, placed within reach of those of the labouring population who are doomed to reside in towns; but they who for several years have been striving to place the benefits of a healthy dwelling within their reach, whilst knowing by experience something of the numerous difficulties to be overcome, and being fully aware that, in many cases, it may be impossible to accomplish all that is desirable, ought not on that account to be daunted in the pursuit of an object of such great and wide-spread importance.

In returning from this digression to the structural features of a healthy dwelling, I would point out the great importance of direct external ventilation and light to all waterclosets, including those in servants' use. It is obvious that constructive defects here must be a very serious evil. The water-pipes should be carefully protected from the effects of frost. I notice also that it is of much importance the *chimneys* should draw so that the smoke will properly ascend; when it does not, the air is greatly contaminated by its escape into the dwelling. The smoking of chimneys, if not caused, as it often is, by the want of sufficient air in the apartment,* or by bad management in the first lighting, or in the putting on of

* The late Mr. Thomas Cubitt told me that he had frequently cured smoky chimneys, in houses of his own building, well known to be amongst the best in London, by an imperceptible admission of a little air over the room doors, the woodwork fitting so closely that when they were closed sufficient air could not gain admission to the room.

fuel, frequently arises from the proximity of more lofty buildings, or of trees, and too often from a defect in the construction, such as being too large to ensure a continuous upward current—an evil which may be sometimes cured by a contraction of the throat. For ordinary chimneys, flues 9 inches square, or, which is decidedly preferable, 10 to 11 inches diameter, are quite sufficient. Those for rooms above the ordinary size and for kitchens are exceptional. The dampness of flues in a thin external wall is often the cause of their smoking.

4. *Light** well diffused over all parts of a dwelling is essential to its being healthy. A dark house is not only gloomy and dispiriting, but is always unhealthy. We know on high medical authority that "the amount of diseases in light rooms as compared with dark ones is vastly less." Light ought to be diffused over the whole dwelling, so that no dark corners be left to invite a deposit of that which is untidy or offensive. Happily the motive which in times past led so much to an exclusion of the light of heaven no longer exists, and though ages may pass ere the evils resulting from a vicious legislation are entirely swept away, yet the removal of the tax on windows and of that on glass, must, amidst much to discourage those who have long and zealously laboured in the cause of sanitary amelioration, be regarded as most valuable concessions in its favour.

5. *Ventilation and Artificial Warming*.—These are questions of vital importance in regard to dwellings, though, judging from the neglectful indifference of multitudes, their value is far from being duly appreciated by the educated, and even by some in the scientific classes of the community. Were it otherwise, the closeness perceptible on entering many of their dwellings, the oppressive heat of the rooms, the sickening fustiness in the apartments occupied by the servants, and too often in those of the children, would certainly not exist. When the number of hours passed within doors by every human being in a civilized state is considered, it will be manifest that the breathing of vitiated air for so large a portion of the twenty-four hours must be as injurious as living on unwholesome food.

Unnecessary as it is for me to describe the component parts of the air,† the process of its deterioration in passing through the lungs, or to dwell further upon those sources of impurity and other

* Although the influence of light on physical life is a subject on which but little is known, some important facts are recorded. Sir James Wylie, who studied at St. Petersburg the effect of light as a curative agent, found in hospital rooms in that city, which were without light, that only one-fourth the number of patients left cured, as compared with those who had occupied properly lighted rooms.—*Vide* an article by Sir David Brewster in the *North British Review*, vol. xxix., 1858, entitled "Researches on Light."

† Amongst the numerous works which may be consulted on this and other important questions connected with my subject, I would recommend "The Principles of Physiology applied to the Preservation of Health," by Dr. Andrew Combe; or the more popular publications by Dr. Lankester and by Jarrold & Co.

accessory influences in and about a dwelling which tend to vitiate the air within, it may be useful, before giving the results of my own observations on the means of obtaining efficient ventilation, that I should notice one important preliminary consideration, that of the space required to keep a healthy man in full vigour, on which very different opinions have been expressed. Experience gained in poorhouse dormitories, in prisons,* &c., has led to the conclusion that from 450 to 500 cubic feet are requisite thereto, and that the ventilation should be such as will cause an entire renewal of the air about once in the hour.

Observations made at the Model Lodging-house, in George-street, St. Giles's, a confined situation, satisfy me that the cubical space of 535 feet, which is provided in the dormitories of that building for each inmate, is, with proper ventilation, abundantly sufficient to render them healthy; such was proved to be the case, even when the cholera raged in the neighbourhood, and had not a single victim out of the 104 men who lodged within its walls. From this fact I think it reasonable to infer that the unhealthiness of the Wellington Barracks, Westminster, where the cubical space per man allowed in the dormitories is stated to be 500 feet, must have arisen, not from want of space, but from some other existing evils, particularly the defective ventilation pointed out in the report made to the General Board of Health by the Commission on Warming and Ventilation.

As mistakes with regard to space tend to create imaginary difficulties, and either impede sanitary reform, or cause a serious unnecessary expenditure,† I think it of use to notice two recent errors on this point which have come under my observation—one in the *Quarterly Review*, where, in an article on "Labourers' Homes," it is stated that "The Lodging-house Act requires an allowance of

* The space allowed in the cells of prisons should not be regarded as an absolute criterion; at the Model Prison, Pentonville, there are about 800 cubic feet.

† The Report of the Government Commissioners on Warming and Ventilation says, at folio 99:—"Under all the circumstances, we would urgently direct the attention of the Minister-at-War and the Horse Guards to the *absolute necessity* of providing more room and accommodation for the soldier in barracks; and that instead of 500 cubic feet of space, that 700 to 800 cubic feet should be allowed per man, or, as in the case of the Wellington Barracks, that only ten persons should occupy the space allotted to sixteen; and that these regulations should be enforced as soon as extra spaces can be provided throughout the whole of the United Kingdom." In a previous part of the report, at folio 92, are found the following apposite remarks, which scarcely appear to have emanated from the same mind:—"The continuous removal of impure air, as it arises, is of very much greater importance than the cubical contents of air in a room. In the soldiers' rooms, which are constantly occupied, the amount of cubical space can be of very little importance, for how lofty soever the rooms may be, unless the heated and impure air can pass away, the space will soon be occupied by air unfit for respiration, and the greater or the less size of the room will only resolve itself into a little more or a little less time before the air is brought into an impure condition." "The soldiers' rooms are about 12 feet in height; with good ventilation, this might be reduced to 11 feet or even to 10 feet without disadvantage."

700 cubic feet per person ;" another in a publication by Dr. Druitt, entitled "The Health of the Parish," where it is said that "It has been decided at Bow-street that every inmate of a family ought to have 400 cubic feet of space." On inquiring at Bow-street as to the latter decision, I learned that the magistrates have no power to determine the space, and was referred to the Assistant Commissioner of Police, who informed me "that 30 feet superficial is the space allowed to each lodger in the metropolitan common lodging-houses, the rooms averaging 8 feet high, which is equal to 240 feet cube, and that 50 feet superficial is allowed to each police-constable lodged in a station or section-house, the rooms on an average being 9 feet high," which is equal to 450 cubic feet. The Poor Law Board, without laying down any fixed rule applicable to all circumstances, adopts as a basis of calculation an allowance of 500 cubic feet for every person in sick wards,* and 300 cubic feet for every healthy person in the dormitories. The Sanitary Inspector in Dublin requires in registered lodging-houses an allowance of 308 cubic feet to each person.

Dwellings for all classes of persons, in order to their being healthy, should be so constructed as that they will be *everywhere accessible to pure air*, and be free from stagnation in any part ; and, whilst it is obvious that the state of the surrounding air must have much influence on that within the dwelling, the renewal of the latter should always be sought from the purest source, instead of the supply being drawn, as it often is, from a low damp situation or a confined internal court.

Considered practically, the *main question* with regard to ventilation is, in what way the air which has become vitiated can be renewed with a supply of pure fresh air, without the creation of a draught injurious to health? To do this the air must enter copiously, and almost imperceptibly, and when used, or become vitiated, its exit should be both continuous and complete.

Ventilation is of two kinds, *natural* and *artificial*; the former being effected by means of windows and doors, with the crevices round them, as well as by chimneys and fireplaces, which are important agents in natural ventilation, and may also, by scientific arrangements, be made conducive to an efficient system of artificial ventilation, peculiarly applicable to dwelling-houses.

In new buildings improvements may be easily adopted which are not always applicable to old buildings ; but, as far as circumstances allow, they should be carried out, from a settled conviction that pure air is indispensable to a healthy state both of body and mind.

* In order that the amount of space now deemed requisite in hospitals may be readily compared with the above, I quote the following :—"In solid-built hospitals the progress of the cases will betray any curtailment of space much below 1500 cubic feet. In Paris 1700, and in London 2000, and even 2500 cubic feet, are now thought advisable."—Miss Nightingale's "Notes on the Sanitary Condition of Hospitals."

Windows properly constructed, made to open at the top as well as below, and suitably placed, afford the most ready means for the natural ventilation of dwellings, besides which are the various contrivances of louvres, of perforated glass, zinc, tin, &c.

Chimneys act as ventilators whenever a fire is lighted in a room: the lower stratum of air being immediately set in movement, a current of air is established from the crevices round the doors and windows, or from any other openings towards the chimney, whereby much of the vitiated air is carried off. This process of ventilation takes place in a slight degree when there is no fire in the chimney, and therefore bed-rooms are much more healthy with a chimney than without. It should not, however, be forgotten that a large portion of the vitiated air ascends above the chimney opening, and therefore it is essential that a provision be made for its removal thence, whenever perfect ventilation is desired.

An independent supply of fresh air may be introduced into most rooms which have a fireplace, by conveying it through a pipe or channel formed under the floor, or in the wall, to an air-chamber constructed at the back or sides of the stove, in order that it should be there warmed before entering the room. I have seen in Edinburgh a solid fire-clay bed-room chimney-piece and grate so formed as to leave, when it is set, a cavity round it, which appears well adapted for this purpose. The same, or a separate pipe or channel may also be used for feeding the fire with air, independent of that in the room; for this purpose it should pass out at the cheeks of the stove, rather than beneath the grate, which is liable to cause a diffusion of dust in the room.

Chimney ventilating valves are rendered, by such a supply of air, more certain in their action than they often prove to be, owing generally to an insufficient draught in the chimney, which causes the emission of smoke into the room. These valves would be invaluable for the discharge of vitiated air, which is their intended purpose, were it not for this occasional ingress of smoke. The most effective means of avoiding that evil is the carrying up an independent flue in close contact with a smoke flue, constantly in use, as that from the kitchen, the air within the ventilating flue is by this means rarefied, and the action of the valve rendered more efficient. Tubular flues, of pottery, made double for this express purpose, are found to answer well, and have the advantage of occupying but little space, whilst they are not liable to the objection pointed out to me many years since by an eminent builder who had found that cast-iron flue linings, having no mortar joints, acted as a dead shore in the wall. In cases where the chimney-valve, being fixed in the flue, causes an ingress of smoke, the most effectual remedy is, I believe, Dr. Arnott's smokeless grate, with the draught duly regulated by a contraction of the vacant space over the fire. These grates economize fuel considerably.

Ordinary grates, I may here remark, are alike wasteful of heat and fuel, both of which would be much economized by the substi-

tution of a stove projecting slightly into the room, and combining the chief advantages of the one known as Dr. Arnott's ventilating stove, with the cheerful open fireplace. I have seen some such stoves in use on the Continent, and I believe that the only valid reason against their adoption in England, beyond the force of custom, is the difficulty—not, however, an insurmountable one—of applying them to fireplaces with the ornamental chimney-pieces in such general use. One of the most useful modern improvements in grates is that of forming the back and linings with fire-brick instead of iron.

The intimate connexion between warming and ventilation has led to a digression, in returning from which I remark that, in order to render natural ventilation effectual, the openings required for the escape of vitiated air should be placed either in the ceiling or near to it.* How far the admission of fresh air also in the upper part of the room be objectionable, on the ground that the air vitiated by breathing, which ascends in consequence of its relative lightness, is in that case only *diluted*, and not entirely replaced by pure air, remains, I believe, yet to be determined by properly conducted experiments.

It would be a vain attempt to point out the most suitable situation, or even the level at which, under all circumstances, fresh air should be admitted. The point of greatest importance is the avoidance of a perceptible current or draught; and wherever that can be combined with the admission of a sufficient volume of pure air, there it may be allowed to enter. In some situations this may be near the floor, or a little above it, in others an arrangement suitable for the purpose may be made by fixing a hopper or a sliding ventilator over the door,† or in the upper part of it. A plan often applicable to bed-rooms, where good ventilation is so essential, though lamentably neglected. In small rooms with a fireplace, this addition to the usual means of changing the air, generally suffices to keep them in a healthy state; but where there is no fireplace there should be a distinct provision for the escape of the vitiated air, which may sometimes be effected by means of a pipe carried through the roof and bent on the top. It should be remembered that

* In a certain description of common rooms, ventilation may be effected by means of wooden tubes perforated with holes, or having chinks at the angles; in some cases they may be carried across the ceilings, and in others be fixed at the angles. They have also been used for admitting fresh as well as for the exit of vitiated air. These tubes distribute the air more generally, and are not so likely to be closed as either Sherringham's or Hart's Ventilators, both of which are very useful in many situations. A cheap cottage ventilator may be made with a triangular piece of zinc, fixed in an upper angle of a window, and perforated in the centre, with a projecting rim formed round the perforated part, in order to receive a moveable cover, which may be hinged.

† If arrangements were made for this purpose in the construction of new buildings, much benefit might be derived therefrom.

where openings can be formed on the opposite sides of rooms, the air will be most speedily and effectually changed.

With all the various contrivances and arrangements proposed for the admission of fresh, and the exit of vitiated air, unaided by those appliances which are scarcely consistent with the term *natural* ventilation, none have come under my observation which secure uniform action, and fully guarantee that the distinct provision made for the exit of vitiated air shall not become the medium for the ingress of cold air, on a change of temperature in the apartment, the frequent consequence of which is a draught, more or less perceptible. In order to avoid this evil, various means have been adopted, according to circumstances, with varying success. The use made of chimney-shafts for this purpose has been already noticed. Tubes or shafts, of wood, of clay, or of metal, are also available, provided a constant outward current is maintained by such an application of heat as will sufficiently rarefy the air. Hot water has often been applied externally for this purpose with advantage. I have used gas enclosed within an upright shaft, partly of wood, the light being placed behind a square of glass, and the air entering through perforated zinc, with a hopper enclosure ; by these means the combined benefits of light and ventilation are obtained from the same quarter. In many situations this simple plan might be easily adopted, and in dwelling-houses generally I believe that gas might frequently be rendered a valuable contributor to ventilation, instead of being injurious to health. As a sunlight, with a double tube, it has been so employed in public buildings with success.

The utilisation of heat from stove fires, from hot water, or from gas in ordinary use about a house, is apparently so natural and easy a means of obtaining a motive power to assist in the ventilation of dwelling-houses, that I have noticed them under the head of *natural*, rather than of *artificial* ventilation, to which I must now refer.

Artificial ventilation is ordinarily effected by the action of valves, fans, pumps, screws, furnaces, stoves, or other artificial heat, and a variety of contrivances whereby air is either drawn out of, or forced into an apartment. In the one case, the space occupied by the vitiated air withdrawn, is replaced by an admission of pure fresh air ; and in the other the pure air forced into the apartment causes a displacement of the vitiated air, for the escape of which due provision must be made. In both cases a just proportion between the volume of air which ought to enter, and that which should be expelled is necessary. In order that the fresh air may be adapted for use at all seasons of the year, means must be provided for warming it prior to its distribution in the apartment. The best means for effecting this is, I believe, by bringing it in contact with heated fire-brick, suitably arranged in stoves or furnaces. When heated iron is used for this purpose the air is liable to be deteriorated, or, as is commonly said, burnt.

Hot water, which is similarly employed, has not this injurious effect.

Whether suction or propulsion be preferable as a motive power for effecting the change of air in ventilation, is a question which has been much discussed here, as well as in Paris and Brussels. After examining both systems in their practical application, the latter appears to me decidedly preferable, excepting in peculiar cases, when the power of suction may be more readily applied.

When fresh air is forced into an apartment, through suitably placed openings, it becomes more generally diffused than it does when its entrance is dependent on the withdrawal of the vitiated air by means of suction, the tendency of which is to draw the fresh air towards the point of exit, instead of leaving it to disperse and circulate freely. Suction involves the further disadvantage of setting in movement whatever noxious vapours may be within its reach.

Nothing can be more inconsistent with a healthy system of warming than those arrangements which provide only for raising the temperature of the air already in the apartment, vitiated as it may be. Such is mostly the case when the German hot-air stove is used, and also when hot water is circulated in pipes through the apartments; but either may be employed with impunity as an auxiliary to an open fire.

Whilst artificial ventilation is mainly applicable to public buildings, to manufactories, and to dwelling-houses of considerable magnitude, its principles may often be adopted in ordinary instances occurring in an architect's practice.

For this reason, as well as on account of the great influence which ventilation exercises on health, more has been said on this branch of my subject than some may consider necessary. I cannot, however, quit it without expressing a regret that the science of ventilation* has not been more thoroughly mastered and its practical application more simplified than it would seem to be from the Report of the Government Commissioners on Warming and Ventilation, known doubtless to many of you, and which, with its mass of practical information appears to me to have failed in placing the subject in that clear light which was contemplated in the suggestions made by Dr. N. Arnott, in 1849, for an investigation by "a committee of eminent scientific men, comprising chemists, engineers, and physicians."

Thirdly.—THE CIRCUMSTANCES WHICH DEPEND MAINLY, THOUGH NOT WHOLLY, ON THE OCCUPANTS THEMSELVES—external and internal cleanliness, and a proper use of structural arrangements—remain to be briefly noticed.

The most suitable provision for rendering a dwelling dry, or for its efficient ventilation, will not secure the health of the occupants

* A simple test, whereby the deterioration of the air could be readily ascertained, is a great desideratum.

if those provisions are not properly used, or if there be around or within the abode an accumulation of dirt, whether in a solid or in a liquid state. Houses may, to all appearance, be very desirable dwellings, but if the drainage be out of order, or there are cesspools within their precincts, or untrapped and foul sinks, there is no safety for the inmates. Nor can the close proximity of stables be a matter of such indifference as might be supposed from the practice so prevalent in the most wealthy parts of the metropolis; for one inevitable consequence is that, in the summer, many windows which should be opened for ventilation remain closed, in order to exclude the noxious fumes of the dungheaps.

Neglect of sanitary laws is as much manifested in the country as it is in towns, and on the Continent not less than it is in England. It would be easy to point to spots where the air is unrivalled for purity, and the scenery around of surpassing beauty; and yet such are the accumulations about the dwellings, that it is often difficult to enter the doors without wading through a stream of filth, alike offensive to the sight and to the smell. Can it be a matter of surprise if such violations of the known laws by which God regulates the health of his creatures, be visited with sickness and premature death? With equal certainty as to the issue, we may predict that those who live in close proximity to black and stagnant pools, to foul ditches, or to sluggish open drains, will periodically suffer from fever or dysentery, as we do that the house in flames will be consumed if the destructive element be not extinguished, or that the neglected garden will be overrun with weeds and become a wilderness.

Internal cleanliness in the houses of the *wealthy*, and all that as matters of daily routine are connected therewith, including proper attention to the sinks and traps, as well as the ventilation generally, is, in the main, left to the care of servants;* and often through their ignorance, rather than their culpable neglect, the health of the family, and especially that of the younger children, is very seriously injured, without the slightest apprehension as to the cause. Many instances might be cited in proof of a fact which is calculated to arouse even the most self-indulgent, and to induce them to co-operate in such a diffusion of sanitary knowledge as will alone insure, that which is dependent on the occupants themselves, a proper use of the structural arrangements essential to a healthy dwelling. Disease may often be communicated to the wealthy through the medium of articles of clothing made in unhealthy dwellings, a fact which, if it were more palpable, might lead even the most selfish to consider their personal interest in the sanitary condition of the houses of working people.

* The recent publication in a cheap form of Miss Nightingale's highly practical "Notes on Nursing" affords the means of conveying many valuable lessons on this subject to domestic servants. I have endeavoured to give some practical instruction of a more general character, in a lecture entitled "Home Reform; or, What the Working Classes may do to improve their own Dwellings."

The *middle classes* would contribute less grudgingly than they frequently do, towards the cost of public sanitary improvements, and would even urge their extension, if they were better acquainted with the laws of health and the heavy expenses which their infringement often involves on the community, as well as on individuals; whilst a practical knowledge of those relating to in-door life—whether it be that of the dwelling-house, the manufactory, or the workshop—would lead them duly to appreciate the advantages of cleanliness and good ventilation, and to see that their benefits were extended more generally to those hives of human industry where numbers of working people congregate for many successive hours, partly under the deleterious influence of gas light.

If the want of knowledge and forethought debar many in the upper and middle walks of life the full enjoyment of a healthy dwelling, how much more is it the case in regard to the *labouring population*, most of whom are under the further disadvantage of having scarcely any choice as to the external circumstances of their dwellings, and often but little as to the internal accommodation. The difficulties arising therefrom, which working people have to contend with in most thickly populated towns, are well known to be very great. I shall not dwell upon them here, nor attempt to point out the degree in which they are increased by habits of intemperance—the most fruitful cause as well as consequence of domiciliary wretchedness. Such a calculation as would show the probable amount expended by the working population in the metropolis and its suburbs in the 10,200 houses open for the retail sale of intoxicating liquors would be instructive, not only as to one fruitful cause of the evil, but also as to legislative measures, of an indirect character, needed for its removal.

Some of the benefits resulting from the efforts made for supplying *healthy dwellings* for the working classes may be judged of by a single quotation from an Official Report laid before Parliament. It refers to the houses built in Cowley-street, Shadwell. *Vide* p. 38:—

“The erection of these Albert cottages, provided with arrangements essential to health, comfort, and morals, is producing the happiest results in the neighbourhood. Tenants have become sensible of the discomforts and evils of their unwholesome dwellings, and will not remain in, or take houses, without many improvements which formerly they were content to do without, and landlords are finding it to their interest to improve their old houses; and in constructing new ones to provide superior accommodation and conveniences.”

Those who now appreciate but little, if at all, that which is so essential to their wellbeing, may, by such means as these, be practically taught the value of a healthy dwelling.

THE Second branch of the Subject now to be considered is
—The Extension of the Benefits of a Healthy Dwelling
to the Labouring Population.

The numerous discussions bearing on this question which have taken place in Parliament, in the daily papers, as well as in other periodicals and pamphlets, might lead to the supposition that its importance is now duly estimated by the public; but those who have sounded the depth and scanned the wide-spread extent of the evil to be remedied, well know that such is not the case, and have too often seen the responsibility of contributing to its removal ignored by those who ought to feel its weight; whilst in some deeply to be regretted instances, the want of a due estimate of the difficulties to be overcome, and of the requisite practical knowledge, has led to the pursuit of measures which, owing to their non-remunerative pecuniary results, have tended seriously to retard the progress of a movement, practically commenced eighteen years since.

The *pecuniary* features of the question are of such vital importance, from their necessary bearing on the adequate extension of the work, that I cannot here omit the expression of my belief that if the actual expenditure in providing improved dwellings for the labouring classes in towns had more generally been managed with such discretion as to yield the very moderate return of 4 per cent. or even of $3\frac{1}{2}$ per cent., after the payment of all expenses and the providing a sinking fund for the repayment of the money laid out, there would have been no difficulty in obtaining from philanthropic capitalists an amount sufficient for building a very large number of improved dwellings, in the metropolis, as well as in our provincial towns; and in evidence that such a return is obtainable numerous examples might be instanced of that and a higher rate of interest on the outlay having been regularly obtained. Whilst some of these will be noticed hereafter, I think it right to remark, in reference to certain exceptional cases, that due allowance should be made for the difficulties and extra expenses attendant on most new undertakings, as well as for the experimental nature of some of the establishments in which the accommodation provided has been of a very mixed character. The results in those instances show, I believe, invariably, that new houses for families yield a better return on the outlay than lodging-houses for single persons, a purpose to which, however, old buildings have been adapted with very satisfactory pecuniary results.

Speculative builders, or those who are merely seeking what is usually called a good investment, would not, of course, consider 4 per cent. a sufficiently remunerative return; but I confess to feeling some surprise that, amongst the many who have accumulated

large fortunes in connexion with the building trade in the metropolis, I know of only one firm, that of Messrs. Newson and Son, having so invested a part of the gains derived, in a large measure, from the labour of the working classes. It may, however, be owing to my limited means of information in this respect that I am unable to name other instances in the metropolis, though in Edinburgh several such examples were lately pointed out to me, which I could not but regard with peculiar interest and as well worthy of imitation. Some notice of these buildings is given in my report made at the Glasgow meeting for the Promotion of Social Science. I have also seen with pleasure, in a very useful monthly paper, the *British Workman*, which circulates extensively amongst that class of readers, a view and brief notice of a village near Lowestoft, rebuilt by Sir Morton Peto, which is described as one of the most picturesque villages in the kingdom.

Architects have sometimes been reproached for a want of interest and for exercising so little influence in regard to the improvement of the dwellings of the labouring classes. Knowing, as I well do, how rarely the members of the profession* have to do with buildings of this class, such a charge is to me only one amongst many other proofs of the prevailing ignorance with regard to the measures and machinery best adapted to remedy the evil in question, and which I shall endeavour, as far as my ability and experience enable me, to point out, unbiassed by any interest whatever, and only actuated by the earnest desire of contributing to an object which I believe is most intimately connected with the physical, the moral, and the religious improvement of the masses of our population.

The measures for effecting this much-needed reform may be classified under three heads:—

1. Those of a legislative character, and those for which the Executive Government are responsible.
2. Those which ought to be adopted by landowners and employers generally for the benefit of their dependents, whether as tenants or workpeople constantly employed by them.
3. Those which originate from benevolent motives, and are undertaken either by associations or by individuals, in order to aid those in helping themselves who need such aid.

In noticing successively these three classes of measures, some illustrative facts will be stated, which are partially the results of observations made during a residence of nearly five years on the

* My long and highly-esteemed friends, Mr. Sydney Smirke and Mr. G. Gilbert Scott, have manifested, in their published works, a warm interest in this object; the former, in his "Suggestions for the Improvement of the Western Part of the Metropolis," published in 1834,—and the latter in his "Remarks on Secular and Domestic Architecture,"—expatiate on its importance, and propose practical measures; whilst the voice and pen of Mr. George Godwin have not only been exercised unceasingly for its advancement, but often also in vindicating the position and feelings of the members of his profession with regard to the question generally.

Continent for the recovery of health. Some of the investigations then made lead me to remark, in reference to the first class of measures, that a jealous respect for the rights of persons and property, which is our security for many of the inestimable advantages enjoyed under a free government, has a manifest tendency to impede the carrying out of such public improvements as those which, under arbitrary rule, have been effected with unprecedented rapidity, on so gigantic a scale, in the metropolis of a neighbouring country. What I think, in our own metropolis, we have a right to complain of, and ought to feel ashamed at, is the bungling and pettifogging manner in which many of our new streets have been formed, and fine opportunities for obtaining magnificent effects irrecoverably lost. It would be invidious to point them out; they will readily suggest themselves to you.

Time will not allow me to dwell on the important bearing which the formation of new streets has on this subject, or many facts which have come under my own observation might be stated, particularly some with regard to that great financial failure, Victoria-street, where several fruitless attempts were made to obtain from the managers, on reasonable terms, back land, as sites adapted for dwellings suited to the displaced population, who, as a necessary consequence of the clearance which had been made, were huddled together in a frightful degree. This is but one example of what has so frequently taken place elsewhere in our own metropolis, owing to the want of a compulsory provision for the displaced poor.

The same neglect on the part of the Government was the cause of an incalculable amount of suffering in Paris, when the people who tenanted its narrow and winding streets were forcibly ejected, and often their few articles of furniture placed on the pavé, they themselves not knowing where to seek shelter. I visited more than once, in the spring of 1858, a kind of encampment of 600 such families, formed not far from the *Barrière de l'Etoile*, and heard from some of them their pitiable tale, and the exorbitant rent they were paying for temporary hovels, which the police had warned them would be pulled down in three months, and they forced again to go they knew not whither. From a sense of duty, and encouraged by the fact of the Emperor having caused the paper which I read before the Institute in 1850 to be translated and widely circulated in France, I thought it right to bring this subject under his Majesty's personal consideration, in a memorial, which was graciously received, and I hope, has not been altogether fruitless.

Our own legislative measures tending to give to the labouring population the benefits of a healthy dwelling, only comprised, when I addressed the Institute twelve years since, the passing of the Public Health Act, and the Nuisance Removal and Diseases Prevention Acts. Since then several measures, the necessity for which was dwelt upon in my paper, have been adopted, such as the removal of the tax on windows and on bricks, for both of which we

are indebted to the Administration under Lord John, now the Earl Russell; the act for the regulation of common lodging-houses (one of the most, amongst the many, valuable efforts of the Earl of Shaftesbury in this cause); the empowering, under the Labourers' Dwelling Act, the formation and general management of independent local Associations, formed for providing improved dwellings, on the principle of joint-stock companies, with limited liability. Other bills have been passed for facilitating the construction of improved labourers' dwellings and cottages in Scotland and in Ireland.

During the last session, a bill which would have given to English landowners, tenants in tail, the power of raising money for building improved cottages on their estates, very similar to that already granted in Scotland, was, after it had passed the House of Commons with but little opposition, rejected by a majority of 16 to 13 in the House of Lords. The debate on this occasion had at least the appearance of showing how much less real interest is taken in this question than might have been inferred from several debates, at the opening of the session, relative to the destruction of labourers' dwellings, in consequence of the introduction of railways to the centre of the metropolis. Those debates led to the insertion of clauses in some of the railway bills obliging the companies to provide certain cheap trains, at hours suitable for the conveyance of working people to and from the precincts of their residences out of town. A standing order, intended to apply to cases in which application is made to Parliament for power to pull down houses occupied by the working population, was passed by the House of Lords in 1853, at the instigation of the Earl of Shaftesbury, but, as far as practical results, it had become a dead letter.

That further legislative interference is indispensable to the remedying existing evils might be proved by abundant evidence. Excepting within the city of London,* and in the case of common lodging-houses, no power has yet been granted effectually to check *the evil of overcrowding*, in regard to which the Medical Officer of Health in the city of London thus speaks:—"Without doubt, it is the worst of all the unwholesome influences with which you have to deal; and until it is corrected you will never be secure from those outbursts of disease which appear to set your sanitary measures at defiance." A report made by the Assistant-Commissioner of Police on the condition of single rooms occupied by families in the metropolis, without the precincts of the city authorities, after giving in detail about forty most painfully disgusting examples of overcrowding, says:—"It is evident from these cases, which might be greatly multiplied, that all the evils which the Acts for regulating common lodging-houses were intended to remedy still exist, almost without

* The power referred to was conferred in 1851, and under the supervision of the able medical officer of health it is exercised with great benefit to the poor, as a diminution in the returns of mortality from 25 to 23 in 1000, traceable to this and other sanitary measures, abundantly proves.

abatement, in single rooms occupied by families, single rooms so occupied being exempt from the operation of the Act." "The causes are the avarice of owners, and the poverty or debasement of occupants, and the only hope of improvement seems to be in some legislative enactment."

In regard to the *overcrowding of cottages* in country districts, I might remind you of the numerous letters on that subject which not long since appeared in the *Times*,* and were but the echo of what has been said and proved so often elsewhere. It was with a view to obtain reliable statistical returns on this important subject that about eighteen months since the then Secretary of State for the Home Department was memorialized, and urged by a deputation from the Council of the National Association for Social Science, to take advantage of the recent Census for this purpose; but, notwithstanding that the unobjectionable character of the inquiry, and the ease with which it could be made, were fully admitted, the application proved fruitless.

After all that has been done within the past fifteen years by many proprietors in providing improved cottages on their estates, there are yet numbers who need to be made aware of facts which exist on their own property,† and there is reason to fear that, with regard to others, their obligations must be pressed home in such a way as they doubtless would be were the Registrar-General enabled to instance flagrant cases of neglect, and to show what the results are by unquestionable facts. I cannot help, therefore, regarding the loss of this opportunity as a matter for very serious regret, especially when it is remembered how little the Government can do directly towards the domiciliary reform so greatly needed amongst the masses of the population.

By legislative enactments can alone be prevented the recurrence of those hardships and other great evils which have arisen out of the selfish system pursued in some "*close parishes*," where cottages have been pulled down in order to obtain relief from a burthen which is thereby thrown upon a neighbouring parish, regardless of the sufferings endured by the labourer, who is often, as a consequence, compelled to walk several miles to and from his work. A calculation of the positive loss from the waste of valuable time and strength thus expended was made by the late Sir Robert Peel; and

* The writer of one of those letters, "A Berkshire Magistrate," in a note to me lately, says, "I am constrained to confess that from all I see and hear, unless the Government take up the question honestly and fully, little or nothing will be done to remedy evils which are so fearfully apparent. I brought the matter forward at a full attendance of magistrates in Berkshire last week, and of all the influential persons present, influential especially as regards this momentous question, not one seconded my motion."

† A system of registration of the actual condition and extent of accommodation in existing cottages has been suggested by Dr. H. Acland, of Oxford, which, if generally adopted by proprietors, would doubtless elicit some very startling facts. Mr. Parker, of Oxford, will supply these forms of registration on the receipt of a postage-stamp.

yet, how many who have labourers in their constant employ need to be convinced that it is as much their interest to care for them in regard to their dwellings, as it is to provide well situated, healthy, and convenient stables for their cattle?

An amendment of the laws relating to the Transfer of Land would in no small degree facilitate the providing improved cottages, and enable the working classes more easily to become the owners of their own dwellings, an object which has proved in England as well as on the Continent, a very powerful stimulant to forethought and general good conduct.

The only other legislative measure which I shall point out as being especially needed, is one that would operate generally to prevent the building of small houses on undrained ground, and without proper sanitary arrangements. Such a fruitful source of sickness and consequent expense to the public ought, without doubt, to be entirely interdicted; it is an evil, the extent or the magnitude of which, it would be difficult to estimate with accuracy.

As bearing on this and several other points which have been referred to, I may quote the words used two years since by a right hon. gentleman, the present First Commissioner of Works—"As yet the necessity of protecting life from the influence of poisonous dwellings has not practically been acknowledged, though the principle is in the statute book."

It is unnecessary to occupy your time at any length with that which has been done for the object under consideration by the Governments of other countries, where, in numerous instances, our example has been attentively watched, if not followed. In some of these cases I have had the pleasure of tracing the results of my own labours in this cause, abroad as well as at home, rendered in the former mainly through personal intercourse, and the circulation of translated papers.

2. In noticing the measures which ought to be adopted by *land-owners and employers generally* for the benefit of their dependents, such as tenants, or workpeople in their constant employ, I feel that a quotation from the letter of the late Duke of Bedford, given at length in my former paper, is the best reply which can be made to the excuses of many for their neglect of duty in this respect:—"Cottage building, except to a cottage speculator, who exacts immoderate rents for scanty and defective habitations, is, we all know, a bad investment of money; but this is not the light in which such a subject should be viewed by landlords, from whom it is surely not too much to expect that whilst they are building and improving farmhouses, homesteads, and cattle sheds, they will also build and improve dwellings for their labourers in sufficient number to meet the improved and improving cultivation of the land. To improve the dwellings of the labouring classes, and afford them the means of greater cleanliness, health, and comfort in their own homes; to extend education, and thus raise the social and moral habits of those most valuable members of the community,

are among the first duties, and ought to be among the truest pleasures, of every landlord."

The example which was set by his Grace in the building and improving the cottages on his estates in seven different counties involved, in the course of eight or ten years, an outlay of about 70,000*l.* Another instance of princely expenditure on the same object is that of the Duke of Northumberland, which has been estimated at 100,000*l.* The average cost of the cottages built by these two noblemen may be stated at from 90*l.* to 120*l.* each.

The question of a *remunerative return* on the outlay in building cottages in agricultural districts, is one which impinges so closely on that of the rate of wages, that I shall not venture on its discussion. It would be hopeless to argue this point with those who think that wages of 8*s.* to 9*s.* per week can properly maintain a working man and his family, as well as pay the rent of a healthy dwelling. With the greatly increased prosperity of agriculture, such a rate of wages appears to me unaccountable, and altogether at variance with equity and sound policy.

The efforts made by some of our great manufacturers for the benefit of their workpeople have been in proportion to those just noticed. Many owners of mines, quarries, and works of various kinds, can bear testimony to the great benefits resulting from their expenditure in providing proper dwellings for the people in their employ.

The same has been the case with reference to the cottages built in considerable numbers by several of the leading railway companies.* The secretaries of some of them, in speaking on the subject, have referred particularly to the great advantage of having the men ready at hand, in case of need, and removed from the temptation presented by public-houses. Government has acted on the same principle in regard to the Police force, and, taking the idea originally from the model lodging-houses, barracks have been built generally, for those of them who are unmarried—a good precedent, which might doubtless be adopted in many other instances with much advantage to both employers and employed. In such cases a sufficiently remunerative rent can usually be charged, and its payment be guaranteed by a deduction from the wages.

A lodging-house, established at Camden-town in 1834, by Messrs. Pickford and Co., the well-known carriers, for the unmarried men in their employ, has now 60 inmates; the payment of 2*s.* 6*d.* per week by the men, and 1*s.* 6*d.* by small boys, covers all expenses and the interest on the outlay, whilst there is "a great improvement in the men as regards orderly conduct, cleanliness, &c." When visiting this house I noticed a common carter copying a piece of music.

* The Great Northern Railway Company has built 150 cottages at their station, near Peterborough, and the Brighton Company has built and acquired nearly 400 cottages for their men.

On the *Continent*, our example has in this respect been much followed. At the Paris Exhibition, 1855, there were many views of workmen's dwellings erected by their employers. In two of them particularly, the leading features of the Prince Consort's Exhibition Model Houses were strongly marked. One, constructed in 1853, at Bourges, provides accommodation for four families on the ground floor, and for twenty single men on the upper floor. The other is that of the Cité Ouvrière des Verriers, at Escautpont, near Valenciennes, which comprises, in a central building, schools and other apartments used in common, with some of the dwelling-houses, but the latter are chiefly contained in two detached blocks, forming the sides of a hollow square. In these buildings the frequent repetition of recessed entrances, with galleries to the upper floor, is, from the contrast of light and shade, productive of a novel and good effect.

I have visited dwellings for workpeople built by their employers in Brussels, at Lisle, and also at Mulhouse, one of the chief manufacturing places in France, where the idea of constructing a Cité Ouvrière originated in the receipt of a translation of my former lecture, sent by order of the Emperor. It was commenced in 1853, by an association of manufacturers, headed by M. Jean Dollfus, on a scale more extensive and complete than that of any similar establishment in France. A spacious road, planted on either side, runs between the main groups of cottages, and parallel roads run behind them. The houses are chiefly arranged in detached blocks of four dwellings each, placed in the centre of a square plot of garden ground, which is divided equally between the tenants; two of these dwellings front the main central road, and two the minor or back road—an economical arrangement in regard to cost of construction, and one which admits of good internal ventilation, though not as perfect as when houses are built in pairs. The dwellings, though not precisely uniform in their disposition, have mostly a wide entrance, fitted up with a cooking-stove and sink; beyond is a staircase, leading to three bed-rooms and a closet. The remainder of the ground floor is devoted to the living-room, with a large recess behind the staircase, of sufficient dimensions to contain a full-sized bed; this compartment has a side window, and, in some cases, being partitioned off from the living-room, it forms a small separate room. There are, besides these, several rows of double houses, built back to back, each having a narrow strip of garden-ground; their arrangement cannot be commended as consistent with good ventilation, and the general appearance of the tenants indicated a decidedly inferior class of occupants. Baths, a washhouse, and a bakehouse, as well as a public kitchen and *restaurant*, conducted by a Société Alimentaire, were opened when I visited the cité in 1856; since which have been added a reading-room, a school, a lodging-house for unmarried men, and one for men on the tramp.

In the summer of 1860 there were completed 480 houses, two-thirds of which had been sold to the occupiers, and 90 more were

in the course of construction, land having been bought for 800 in the whole.

The outlay on the roads, fencing and planting, was defrayed out of a Government subvention of 300,000 francs, or 12,000*l.*; being a part of 10,000,000 francs appropriated to such purposes by the Emperor, with a view to stimulate the work in France. The tenants have the option of purchasing the houses by the gradual payment of their cost price, which ranges from 72*l.* to 120*l.* each, and two-thirds of them have done so, to the very marked benefit of themselves and families, and with the further good result of providing the funds necessary for continuing the buildings, without increase of capital on the part of the projectors, to whom, as well as to M. Emile Muller, of Paris, under whose direction they were built, the greatest credit is due.

I have thought that these details may be useful, and perhaps suggestive, with reference to schemes often projected for building workmen's dwellings in large numbers out of our own metropolis, with a view to their occupants being conveyed to and fro by cheap railway trains. With the same object I notice having seen near Paris an entire village, then all but completed, which had been built by a Parisian tailor for his workpeople. It comprises wooden houses, or chalets, for 76 families, 28 intended for single, and 48 for groups of families, each occupying a separate tenement, and having two, three, or four rooms. There are two spacious workshops, and although some defects might easily be pointed out, an air of neatness and order gives the whole a very pleasing effect. Here the work, which is sold in the very heart of the city, and has hitherto been done by workmen residing with their families in miserable, unhealthy, and at the same time high-rented dwellings, will be done under the advantage of abundant light and pure air, greatly to the advantage of the consumer, the employer, and the employed, as well as of the pockets of those who have generally to bear the burden of supporting the working man and his dependents in case of sickness.

It would be easy for me to illustrate by many other examples, at home and abroad, the practical recognition by those who have working people in their regular and exclusive employ, of an obligation to see that they are properly housed, and at the same time to show the benefits resulting therefrom to both parties. But other measures have yet to be noticed, which will be grouped under the last head, viz.—

3. The measures which originate from benevolent motives, and are undertaken either by *associations* or by *individuals*, in order to aid those in helping themselves who need such aid.

My former paper recited the establishment by philanthropic individuals of two associations, one of which commenced in 1844 and the other in 1845, the building of improved or model dwellings for the working classes in the metropolis. Highly beneficial as these societies have unquestionably been in the pioneering work of this

movement, experience has, in regard to one of them, confirmed the opinion I held when undertaking, in 1844, the duties of its honorary architect, that it should aim at doing a little and doing it well, so as to be in deed, and not in name only, a model society, rather than attempt more than from its constitution it could be reasonably expected to accomplish, with such results as would commend it for imitation. The society to which I refer is that for Improving the Condition of the Labouring Classes, which has constructed under my direction four distinct ranges of new buildings, accommodating 97 families in separate dwellings, and providing 94 rooms for single women, as well as lodgings for 104 single men, and a public washhouse with baths. Whilst in three distinct localities, old houses were renovated and fitted to provide lodging for 158 single men. The expenditure on these several dwellings and lodging-houses has been about 36,500*l.*, and they have all been in full occupation since 1852.* Subsequent to my going on the Continent, in 1853, three entire courts in different localities were taken, and the condition of the houses in two of them, which were indescribably filthy, and occupied by the lowest class of tenants, was completely changed. The number of rooms collectively contained in these courts is 275, and there is also a single men's lodging-house with 40 beds. The total outlay on these three courts has been 7,226*l.* 1*s.* 4*d.*, and the net return for the year 1859, after

* The receipts and expenses of four of these different buildings during the year 1852, for which I can personally speak to the management of the Society, having then acted on its Committee and as its honorary architect, were:—

Bagnigge-wells: self-contained houses and flats for 23 families, and rooms for 30 aged females. Outlay on land, 1045 <i>l.</i> ; building, 5325 <i>l.</i>	Receipts	£375	7	7
	Expenses	82	6	9
	Net Return	293	0	10
Streatham-street: houses for 54 families, built on flats, fire-proof, and with galleries. Outlay, ground-rent, 50 <i>l.</i> ; building, 8916 <i>l.</i> 16 <i>s.</i>	Receipts	724	7	4
	Expenses	224	18	1
	Net Return	499	9	3
George-street: lodging-house for 104 men, six stories high, including basement offices, and four floors of dormitories. Outlay, land, 1200 <i>l.</i> ; building, 5226 <i>l.</i>	Receipts	618	11	4
	Expenses	306	6	2
	Net Return	312	5	2
Charles-street: lodging-house for 84 men formed out of three old houses, renovated and thrown into one. Outlay on repairs and furniture, 1163 <i>l.</i> 14 <i>s.</i> 2 <i>d.</i>	Receipts	418	0	4
	Expenses	233	5	2
	Net Return	184	15	2

The rents received from these houses have varied but slightly since they were opened up to the present time, and they are generally well filled, the families changing but seldom. The cost of repairs is not included in the expenses above stated; they should be taken as averaging $\frac{1}{4}$ per cent. on new, and generally from 1 to 2 per cent. on old buildings.

deducting all expenses and repairs, was 249*l.* 18*s.* 11*d.*, or 3 $\frac{3}{4}$ per cent. ;* whilst from the Society's new building in Streatham-street for 54 families, where the expenditure was 8,916*l.* 16*s.*, the corresponding net return for the same year was 420*l.* 18*s.* 8*d.*, or 4 $\frac{3}{4}$ per cent. on the outlay, and from the model lodging-house for men in George-street, St. Giles's, the return was 4 per cent. on the outlay, and had been 4 $\frac{1}{4}$ per cent.

The Metropolitan Association for Improving the Dwellings of the Industrious Classes, which is the other Society referred to, had, up to 1860, expended on its ten distinct ranges of dwellings 89,613*l.* 14*s.* 10*d.*, of which 71,328*l.* 2*s.* 6*d.* was laid out on six separate blocks of dwellings in different parts of the metropolis, accommodating 395 families ; the net return from these buildings for the year ending 31st March, 1860, after deducting all current expenses and repairs, amounted to 2,687*l.* 4*s.* 4*d.*, being about 3 $\frac{3}{4}$ per cent. on the outlay.

On two lodging-houses for single men—one of them new, which has accommodation for 234, and the other old, which provides for 128—the return, owing to the want of sufficient occupants, has been very unsatisfactory ; involving, indeed, a considerable loss, which proves that the buildings are either too large, or in some way unadapted to the class of men frequenting their neighbourhood.

It is worthy of observation that the same result has attended a similar lodging-house which I have seen at Marseilles, built outside the town, for 150 men, too far from their daily occupation ; whilst many such houses elsewhere, on a smaller scale, accommodating from 50 to 100 men, and near to their work, have fully succeeded ; in some instances they have been gradually increased, which is the case at Leeds and at Liverpool. Of two adjoining houses, built on the Boulevard de Batignolles, in Paris, to accommodate together 203 men, and having on the ground floor a restaurant and café, one was closed three years since. In this instance, however, the failure is doubtless in some degree attributable to defective management.

From the experience of these two Societies in the metropolis, it would appear that old buildings may be renovated and fitted up for men's lodging-houses, with the prospect of, at least, a fairly remunerative return on the outlay ; in the instance of the Charles-street lodging-house, it has averaged from 12 to 15 per cent., though, in some other instances, the return has been under 5 per cent. Whilst the putting of old courts and blocks of dwelling-houses for families into a good sanitary condition, unless they are obtained at an unusually low price, is not likely to yield a satisfactory return on the outlay, at all events, if done by societies, and taking 4 to 5 per cent. as the lowest rate of interest which such

* This return, though a considerable increase on that of the previous year, is not encouraging, the property being old and leasehold, and no provision for a sinking fund having been made.

investments ought to yield, after provision has been made for repairs,* and a sinking fund to pay off the capital; which it is obvious there should be, especially in the case of leasehold property.

Highly valuable as must be the results of the transformation effected in two of the courts referred to, where filthy dens became decent and healthy dwellings, the actual benefit arising out of these efforts was not conferred to the extent which might be supposed on those who were the occupants of the courts when they were taken by the Society; a considerable portion of them having been ejected in order not only to reduce the number of occupants within a due limit, but also to secure a more eligible set of tenants. My own conviction is very decided that the owners of such property† should be compelled by the law, either to put it into a healthy condition, to close it altogether, or to part with it at its fairly ascertained value to those who may be willing to undertake the necessary outlay. At present, the fact of such property being inquired for by philanthropic persons gives to it a fictitious value; and in numerous instances within my own experience, the object has thus been defeated, or the price paid for the property has been so high that, with the outlay on repairs, its net return is such as to discourage any further attempts of the same kind. An Act of Parliament passed in 1855, and applicable only to Scotland, contains a clause which, in a certain degree, meets such cases; but it appears to me that the principle involved in the entire prohibition of the sale of articles of food, when in an unwholesome condition, applies, with undoubted equity, to dwellings, and that its legal enforcement is the only way of effectually remedying the evil.

Whilst the experience of the two leading metropolitan societies in regard to *old buildings* shows such results—and, as far as my information goes, it accords with that of some other societies—I am glad to notice instances of individual effort which have been completely successful, owing, there can be no doubt, mainly to the exercise of a sound judgment and more careful management in the cases referred to.

In the parish of Chelsea, your honorary member, the Rev. Richard

* The average expenditure on repairs to new buildings should not exceed $\frac{3}{4}$ per cent., and may often be less, whilst it would not be safe to calculate those required to old buildings at less than $1\frac{1}{2}$ to 2 per cent. on the average.

† In a Report lately made by Mr. Nugent Robinson on the Dwellings of the Poor in Dublin, it is stated that "the wretchedness of their dwellings is mainly owing to a class of people called 'house jobbers,' who buy up dilapidated houses, and re-let them, either by the house or by the room. As a general rule the jobber remains behind the scenes, while the actor is some low brutish agent employed on commission to collect the rents by hook or by crook. The 'jobbers' are utterly averse to ameliorating the condition of their tenants, when anything like expense has to be incurred. It is to be regretted that many men of social position belong to this class." The existence of the same evil in our own metropolis has been pointed out long since.

Burgess, and some friends, established, in 1851, two of the earliest renovated houses for families, which have proved an admirable example for those disposed to promote this object in a quiet and unpretending way. The houses are always filled with good tenants, on whom the most favourable results have been produced, and from the net receipts, after the payment of 5 per cent. interest on the outlay, which was 300*l.*, that amount was entirely paid off at the end of 8 years, and since then, there has been a clear profit of between 30*l.* and 40*l.* per annum.

To give another example in London: a few months since I went over a considerable property in the city, part of which, in a central locality, comprises dwellings for 86 families of the working class, and, in another, three entire courts. The owner is a private gentleman, who derives his chief income from house property. On coming into its possession he felt the responsibility of ownership, and desired to put it into a condition fit for the occupation of well-conducted tenants. I can testify to his entire success in that respect, and also to the contrast with the neighbouring property which his presents. All that he was anxious to do has been accomplished without pecuniary loss. His rent-book, kept with much exactitude, shows the greatest regularity of payment, and this he told me compensates for extra expenditures on various objects beneficial to the tenants. The following results of the experience gained in this instance may be useful. Of the gross amount received weekly and monthly for rent, about one-fourth covers the taxes and general repairs, or one-third covers the whole of the landlord's expenditure, including the collection, expenses of schools and medical attendance. A great secret of success has been the forbidding the practice of underletting as a rule, though occasionally a lodger is allowed. Another custom which has the same tendency, is that of the owner going over the property himself frequently. With much consideration and justice to the proprietor, one part of this property was, on a recent application made to Parliament by a railway company for power to take it, treated as an exceptional case, and allowed to remain as an instructive lesson to neighbouring owners: amongst others, the railway company which coveted its possession.

The success which has—doubtless, in the main, owing to careful management—attended the Society at Hastings, renders it worthy of special notice. It was established about five years since, and has now a paid-up capital of 16,000*l.*, of which 14,000*l.* has been expended in purchasing the freehold and putting into good condition about 130 old cottages and two lodging-houses. An annual dividend of 6 per cent. has been paid to the subscribers, besides laying by 1 per cent. per annum as a reserve fund. A benevolent fund is formed among the tenants, and two visitors inspect the property every fortnight.

The three examples referred to in succession, after the two metropolitan societies, are instances in which *old* buildings have

been exclusively operated upon. I shall now briefly allude to some instances in which societies have constructed *new* buildings, with more or less pecuniary success ; and as there have been, since 1850, from 25 to 30 such societies established in various provincial towns in England, besides those in London, you will not expect me even to name them all.

The Strand Building Company, on their houses for 25 families, in Eagle-court, has paid a dividend of $4\frac{1}{2}$ per cent.

The Windsor Royal Society, which was established in 1852, under the special patronage of her Majesty and the lamented Prince Consort, has now 9,000*l.* invested in new cottages* and in two lodging-houses ; the net returns from which, owing to temporary circumstances, have latterly yielded 4 per cent. to the shareholders, instead of $4\frac{1}{2}$ or 5 per cent., which they would otherwise do.

The Redhill and Reigate Cottage Improvement Society, in a late report, stated that, from the eagerness with which their first built cottages were taken, they have been induced to add twelve to the nineteen with which their operation commenced, and since then eight more have been built. The contract for the second series was at the rate of 120*l.* 7*s.* 1*d.* per cottage. A dividend of 5 per cent. has been paid to the shareholders, and 65*l.* 16*s.* 3*d.* added to the reserve fund, with every prospect, apparently, of the same dividend being continued. These cottages are very near to the railway station, and have a neat appearance ; they resemble much some of those built by the Windsor Royal Society.

Amongst the efforts which may be classed with those of associations, are the model lodging-houses built by the Huddersfield Improvement Commissioners, in pursuance of powers granted by their Acts of Parliament ; and this, I have been informed, is the only instance in which municipal authorities have erected such buildings at the public cost, and out of improvement rates. Provision, in this instance, is made for the accommodation of 221 men, 34 single females, and 12 married couples.

The Corporation of the city of London contemplated, in 1855, the construction of several large piles of buildings for the occupation of such of the working classes as were ejected from their dwellings in the formation of new streets ; but actually, nothing has been accomplished.

It is not necessary for me to notice at length what has been done in Scotland, where, however, exertion, both in the towns and the country, is quite as much needed as it is in the south. The lack of municipal supervision in Edinburgh was proved very recently by a melancholy catastrophe, which issued in the death of 35 human beings, and brought prominently into view the way

* The plans given by me for twenty of these cottages, which are in pairs and in blocks of four tenements each, have been published by the Labourers' Friend Society, and will be found in the third edition of my Essay on the "Dwellings of the Labouring Classes."

in which the poorer population are huddled together in gigantic buildings of seven and eight stories, divided into dwellings of one and two rooms each. The painful scenes I have witnessed in Edinburgh, arising obviously, in a great measure, from drunken habits, rival those met with in any part of the Continent.

In a paper* which I read at the Glasgow meeting of the National Association for the Promotion of Social Science, and which is published in the Transactions of the Association for 1860,† a somewhat detailed account is given of numerous blocks of improved or model dwellings which have been constructed in Edinburgh since 1850. In several of these, but very recently finished, the external gallery (supported by cantilevers) and open staircase system has been adopted; and in other instances, where there is only one upper story, the dwellings in that part—for all are arranged in flats—have their approach on the opposite side of the building to that on which the ground floor is entered, and the access to each dwelling is through its own garden. The Pilrig model buildings, near Leith-walk, is an example of this arrangement; there are 44 houses, the cost of which, including drains, was 92*l.* per house, and they pay to the shareholders a dividend of 5 per cent., exclusive of additions to a sinking fund.

An association in Glasgow, comprising about 12 spirited gentlemen, is engaged in purchasing the property which will enable them to cut a new street through one of the most miserable "closes," and to improve right and left that wretched property. Through the exercise of much discretion, the greater part has been obtained for 8 years' purchase on the rental. 15,000*l.* is advanced for the purpose by bankers, at a moderate rate of interest, on the personal guarantee of the members of the association against loss.

The efforts made in Ireland for improving the dwellings of the working classes may be learned from an address by Lord Talbot de Malahide, and from other papers given in the Transactions at the meeting of the National Association for Social Science in Dublin, 1861.

It has been often remarked, in reference to several such undertakings as have been referred to, "that the *most necessitous* of the working classes are not benefited thereby." In reply, I would say, that it is the want of an adequate supply of such houses which, in most of our thickly-populated towns, forces so many working people into miserable, crowded, and unwholesome dwellings, where they gradually sink in the scale of physical and moral position, ending their days prematurely.

The measures for improving the dwellings of the labouring classes, which have, from benevolent motives, been taken by asso-

* A copy of this paper is in the library of the Institute, as well as another, on "The Improvement of the Dwellings of the Labouring Classes," read by the author, at the meeting of the same Association, held in Liverpool in 1858.

† Other papers which describe the dwellings of the poor in Glasgow are given in this vol.

ciations on the Continent, and in the North American States, are so distinctly traceable to our own in England, that it would not be right to pass them entirely over in silence.

I have noticed already those adopted at Mulhouse, in France,* and have alluded incidentally to some others. All that was done in Paris, to the summer of 1858, I have seen ; and having conversed on the subject with those most competent to form a correct opinion, feel warranted in saying that the good intentions of the Emperor, in appropriating 10,000,000*f.* to the encouragement of this object, in the form of a subvention of one-third the outlay, have not, excepting in a few instances, been seconded. Most of those who engaged to any extent in the enterprise appear to have done so exclusively as a commercial speculation, expecting to derive a considerable pecuniary profit, and uninfluenced by benevolent motives. In addition to this unfavourable feature, the leading French society had a similar misfortune to that which befell one of the earliest established societies in London, through the misconduct of the then secretary, causing in both instances a very serious discouragement to the work. It is necessary to refer to these adverse occurrences, as they alone will account, in a great measure, for the sudden check which this movement had in both capitals between five and six years since.

Turning to a brighter feature of the case, I mention with pleasure, that when passing through Paris last autumn, it was stated to me, on reliable authority, that a very considerable number of suitably arranged dwellings have been recently built in different directions by private enterprise, and with a return of full 8 per cent. on the outlay. Thus, as in our own experience, private enterprise has proved more successful, in a pecuniary point of view, than similar work undertaken by societies.

The first society on the Continent to follow the example given in England, is stated by Dr. Huber, who was for some years its secretary, to have been that in Berlin, formed under the patronage of his Majesty the King, to whose enlightened and personal interest in the work I can testify, having on two occasions had the honour of conversing with his Majesty on this subject. At a late meeting of the society, over which his Royal Highness the Prince Frederick William presided, it appeared that the capital embarked is about 34,655*l.*, and that there are dwellings for about 219 families and 31 work-shops ; the number of occupants being 1,168. The shareholders receive a dividend of 4 per cent., and the available addition to the reserve fund was in one year about 3,195*l.*, one-half of which was, however, repaid to the tenants. At the same time, the annual meeting was held of a kindred, but smaller, society, called the "Alexandra Stiftung," by

* Those who desire to know something of the actual condition of the working classes in France, will do well to consult a recent work, "*L'ouvrière*," par Jules Simons,

desire of the Emperor Nicholas of Russia, who, at its formation in 1852, gave 1000 ducats to the funds. They amounted, in 1858, to about 21,338*l.*, partly arising out of donations and partly from loans at 4 per cent.

With an express view to the construction of suitable dwellings for the working classes in St. Petersburg, where they are greatly needed, an architect was deputed to visit London about three years since, and a large number of such houses have been built by a company formed for that purpose.

At Frankfort, a society formed on a strictly commercial principle, to supply a want greatly felt in that city, is now in successful operation, under the guidance of its energetic and philanthropic promoter Dr. Vanentrapp, who visited England eighteen months ago to obtain information on the subject.

More recently, a gentleman from Bremen has been to me for advice in regard to the carrying out of an extensive undertaking, which contemplates the building a very large number of workmen's houses on church property, without the city. The remarkably favourable terms required for the ground, and the unusually low rate of interest sought for by the projectors, prove the earnestness of all engaged in this good cause, and how really anxious they are to meet the necessities of a case, which is here seen to be, as it is in reality everywhere else, most intimately connected with the well-being of the masses of the population. The study of this example might be profitable to some in our own country.

The usual rate of interest which is sought from such undertakings on the Continent appears to be 4 per cent., with a small sinking fund for paying off the capital. In some few instances it is 5 per cent., and the opportunity is frequently afforded the tenants of becoming the owners of their own dwellings, by a gradual payment, in addition to the rent—a system which renders the dwelling a saving bank, and has been found greatly to stimulate habits of forethought and sobriety.

Much time would be occupied were I to enter on any detailed account of what has been done for this object in other countries besides those named already. The movement has extended to Norway, Denmark, and Sweden, to various towns in Holland, and to Belgium,* where enlightened views on the subject have been advocated in two International Congresses, held under the patronage of the King and the royal Princes. In Bavaria, and in several of the minor German states; in many parts of Switzerland and Italy, model houses now exist. One of the earliest and best arranged is in Florence; it accommodates 100 families; and another range is in progress. How greatly sanitary improvements have long been needed in most parts of Italy, many of my auditors can

* The Belgian Government has published an instructive series of resolutions on the construction of dwellings, which was drawn up and adopted at the meeting of the Congrès Général d'Hygiène, held in Brussels in 1852.

testify, whose first recollections of Rome and Naples are of a more recent date than mine, which go back to 1828-29. When I was at Genoa in 1856, its chief magistrate told me that the municipality had there been put to an expense of 500,000*l.* sterling during the recent attack of cholera, mainly in relieving those of the population who live in narrow streets and filthy dwellings; and he added, "I can now, from experience, confirm what is stated in the publications you formerly gave me, as to the heavy expense which may be incurred in consequence of a defective sanitary state." It is rejoicing to know that Naples is in this respect greatly benefited by its emancipation from a rule so jealous of the semblance of foreign interference, that our ambassador cautioned me against the attempt to diffuse any of that light which even Cardinal Antonelli had spoken of as being especially needed at Naples.

A periodical which has a wide circulation in the North American States, published much of the paper I read before the Institute in 1850, together with plans of the Streatham-street model houses for families; and since then, partly, no doubt, owing to the great interest taken in this object by the late Mr. Abbott Lawrence, American Minister in London during the Great Exhibition, piles of well-arranged model dwellings for families, five stories high, have been constructed in New York and in Boston. In the former city the return on the capital invested is 4 per cent., and in the latter, 6 per cent., with reference to which it is stated that "the effect of proving that houses for the poor can be built on the best plan for the health and comfort of their inmates, and, at the same time, be good investments of property, is manifest in many private undertakings. Several large houses have been already built on similar plans; old lodging-houses have been in many instances remodelled and otherwise improved."

The measures adopted by *individuals*, with a view to aid those in helping themselves who need such aid, remain to be noticed.

Our most gracious Sovereign has honoured by her royal patronage two societies established for this object, and has given substantial proofs of interest in their success; whilst the labourers' dwellings belonging to Her Majesty abundantly manifest a kind and thoughtful regard for the welfare of their occupants. These are but some amongst many other illustrative facts which might be adduced to show that the feelings of the lamented Prince Consort on this subject "are," in the words already quoted, "entirely and warmly shared by her Majesty the Queen."

Much has been done towards a fulfilment of the desire so happily expressed by an ancestor of our gracious Sovereign, "That a Bible should be placed in the dwellings of all his subjects," and we rejoice at it; but who that knows the actual state of vast numbers of those dwellings can be unaware of the obstacles they present to the profitable reading of that book, and to the embodiment of its holy precepts in the daily life of their occupants?

I have briefly stated some of the efforts made of late for the removal of those formidable obstacles which impede alike the physical, the moral, and the religious improvement of the masses of the people, and have endeavoured to point out the practical means which are calculated, through their extensive adoption, to diffuse more widely the benefits of a healthy dwelling amongst our labouring population.

It is my conviction that the feeling of a weighty responsibility, which rests, much more extensively on the upper and middle classes in regard to this matter than is generally admitted, needs to be pressed home and brought into more active operation than it has hitherto been.

With this view I desire to urge on all the example of that truly great and excellent Prince, whose irreparable loss must be long and deeply felt in every branch of effort connected with the objects of social science. And it is with the earnest hope of encouraging and stimulating many to follow in a path which has been trodden by one so illustrious, that I bring before you some of the many and wide-spread results traceable to a single manifestation of the great interest felt by his late Royal Highness in the subject under consideration.

The Commissioners for the Exhibition of 1851 having replied to an urgent application made for a site, "that a model lodging-house does not come within the design of the Exhibition," a memorial on the subject was presented to his late Royal Highness, who immediately expressed the most lively interest in the project, and a desire that the contemplated model houses should be constructed on his own account, in effecting which, it was my privilege to act for his Royal Highness as honorary architect. With much personal trouble to the Prince, the requisite official consents of four Government departments were obtained, for placing the houses in the Cavalry Barrack yard, opposite to the Exhibition. An objection to this site was made by the Commander-in-Chief the Duke of Wellington, lest they should give rise to a feeling of dissatisfaction in the army with the want of any accommodation for married soldiers; an evil which his Grace apprehended the country to be then unprepared to remedy. I notice this fact in order to show how clearly their effects were foreseen by the great Duke, and how speedily good results arose out of their construction. Within twelve months after the Exhibition, a large and well-arranged lodging-house for married soldiers was commenced near the Vauxhall-bridge-road, by an association of officers of the Battalion of Guards.

The benefits resulting from this first essay soon led the Minister of War to commence building separate dwellings for the married non-commissioned officers and men at the Chatham Garrison; and a grant of 30,000*l.* has been made by Parliament for carrying out the same object elsewhere, at the instigation of that great friend of the soldier, and, I may add, of the labourer also, the lamented Lord Herbert. In a note, dated as recently as April last, that dis-

tinguished example of sacrifice to self-denying duty expressed to me his "hope of seeing a great change in the next few years in the dwellings of the rural population." I mention this as an additional call to zealous effort in the good work, for "the night cometh wherein no man can work."

Amongst the number of visitors to the Prince's model houses, amounting to upwards of 250,000, many gave evidence of their having duly appreciated the object for which they were placed in the Exhibition, viz., the conveying practical information, calculated to promote the much needed improvement of the dwellings of the working classes, and also of stimulating those whose position and circumstances enable them to carry out similar undertakings, and thus, without pecuniary* sacrifice, permanently to benefit those who are greatly dependent on others for their home and family comforts. The building was adapted for the occupation of four families of the class of manufacturing and mechanical operatives who usually reside in towns, or in their immediate vicinity—those, in fact, by whose labour the larger portion of the objects in the Exhibition had been produced.

The open staircase and gallery, giving access to the upper-floor tenements, were prominent features in the arrangement of these dwellings, and their subsequent adoption in buildings constructed for working people in towns, has come under my notice in Edinburgh, at Liverpool, Ramsgate, Brighton, Windsor, and other places, as well as in London and on the Continent.

The example which may, perhaps, be pointed to in London as bearing the closest resemblance to the original structure, and as fully answering in a pecuniary point of view, is at Cowley-street, Shadwell, close to a station on the Blackwall Railway, where a number of miserable dwellings, tenanted by the lowest class of persons, came by inheritance into the possession of a private gentleman, W. E. Hilliard, Esq., of Gray's-inn. Actuated by the most philanthropic views, he decided on endeavouring to improve, not only his own property, but also by example the immediate neighbourhood; and his efforts have been crowned with signal success. The old dwellings have been replaced by an entire street of considerable length; on both sides of which houses for accommodating in the whole 112 families have been built, on the general plan of the Prince Consort's Exhibition model houses, with open staircases, giving access to the upper-floor tenements. The twenty-eight blocks of four houses cost 487*l.* each; and, after allowing for ground-rent and all charges, I can state on the authority of the owner, that "they continue to pay upwards of 6, in fact nearly 7 per cent. as a net return on the investment; and what," he adds, "is perhaps of more consequence, they are almost constantly let, and are appreciated

* This point was justly held by H. R. H. to be of primary importance to the adequate extension of the work. The detailed estimated cost of the model block of four houses was 458*l.* 5*s.* 6*d.*

by the tenants, who, as a rule, are pretty stationary, and not migratory, as that class frequently are." The Report of a Public Officer on these houses, has been already quoted.

Scarcely any foreigners who visited the Exhibition of 1851 returned without examining the Prince's model houses, and but few left without carrying back to their several countries some of the publications bearing on the improvement of the dwellings of the labouring classes, which were there abundantly distributed. My own opportunities of judging of the effect of this little structure enable me to say that it gave to the movement an impulse such as it has not received from any other single effort, the results of which have spread far and wide. The descriptive account of the building was translated into German and published at Berlin, much of it also appeared in French.

The collection of sanitary and other appliances adapted to the circumstances of the working classes, which occupied a part of the cottages was the first public exhibition of the kind, and which I had hoped to see continued and increased, when, at the close of the Exhibition, the building was removed to Kennington-park, under the charge of the Office of the Woods and Forests; a proposal with that view having been made to the Chief Commissioner, Lord Seymour. The practical value of such a collection was recognised at the Congress General d'Hygiène, held in Brussels in 1852, where, on my proposal, "the utility of establishing in each country, and also in the principal centres of the population, a collection as complete as possible; a kind of museum where shall be gathered together models, plans, specimens of materials, &c., relating to hygienic amelioration and progress," was unanimously declared.

The Economical Museum, formed by my worthy friend Mr. Twining, at Twickenham, is an expansion of the same idea.

Amongst the numerous other instances of *individual effort* which might be given, I shall only notice—

1st. The building in Lambeth, on the property of his Royal Highness the Prince of Wales, as Duke of Lancaster—a considerable range of model dwellings for families, with shops on the ground floor, at a cost of 16,000*l*. The close proximity of extensive gas works has, I regret to say, impeded that full occupation which is almost invariable in such buildings elsewhere.

2nd. The establishment, by Lord Kinnaird, in Peter-street, Westminster, of some of the earliest renovated model lodging-houses, and his promotion of similar houses in Dundee. In the latter case, the original outlay, as well as the interest thereon, has mostly been paid out of the profits. Although the beneficial operation of the Lodging-house Act has tended to diminish, in some measure, the great necessity for such houses, the adoption of a suggestion made to me by Lord Kinnaird, would doubtless prove of great service to those of the working classes who migrate in search of employment. It is "that every town ought to have a model lodging-house, with notice thereof stuck up at the different railway stations."

3rd. Miss Burdett Coutts has contributed in various ways to the object under consideration, the most important of which is the building, under the direction of Mr. H. A. Darbisher, a considerable range of dwellings for working people in Bethnal-green, one of the poorest parts of the metropolis. In the upper part of this structure, which is four stories high, a covered area for exercise, and a play place for children, as well as a laundry, are provided.

4th. The five piles of family dwellings,* built by Mr. John Newson, in different parts of the metropolis, although susceptible of improvement in some of their details, deserve to be mentioned, on account of the striking contrast which they present to the dwellings generally occupied by the working classes in London. They accommodate 125 families, and have cost 13,200*l*. The annual gross receipts are 1560*l*., the ground-rent, taxes, current expenses, and repairs average 830*l*., which leaves a net return of about 5½ per cent. on the outlay. All these buildings are arranged with open galleries, resembling, in that respect, the Streatham-street and the Prince's Exhibition model houses, which renders them exempt from house duty, each tenement so approached having been pronounced by the Judges to be a separate house in regard to taxation. One important recommendation of this system, besides that of its healthful tendency, from the free circulation of air, and the distinctness of the tenements.

The construction of such houses as these ought, even from self-interested motives, to be encouraged by *Parochial authorities*, which might frequently be done in their rating, in consideration of the diminution in the charges ordinarily arising out of the sickness of the poor.

The scope of my paper will only admit a passing remark with reference to Benefit Building Societies,† of which Mr. Tidd Pratt stated recently that there were 2000 with a paid-up capital of 8,000,000*l*. A machinery so extensive, and having such resources, might, if well directed, accomplish much for the object under consideration; but it is to be feared that many of the houses built in connexion with these societies are inconsistent with a healthy and convenient dwelling. This evil, which has been pointed out to me by the late eminent Dr. Southwood Smith, and other sanitary reformers, would probably be most effectually remedied by the circulation of sound views on the subject, through the medium of Mechanics' Institutions and kindred associations. Here is a fruitful field for *individual effort*, in the cultivation of which much assist-

* Two of them are in Grosvenor-mews, near Berkeley-square, one in Bull Head-court, King-street, Snowhill, and another is the Bull-inn-chambers, Holborn-hill.

† Those who may desire information as to the working of some of these societies, will find an account of the origin and progress of four such associations in Yorkshire, given in a paper read by Mr. J. A. Binns at the Bradford meeting for Social Science, and published in the Transactions of the National Association for 1859.

ance might be derived from the exhibition of suitable plans for the dwellings of working people, as well as from small collections of domiciliary appliances conducive to health and comfort.

The nucleus of such a collection was formed under my direction at the office of the Labourer's Friend Society more than twelve years since, and the idea was carried out, as already noticed, on a very small scale in the Prince's Exhibition Model Houses, 1851, as well as in the compartment belonging to the Labourers' Friend Society in the Exhibition itself.

Experience having shown me the great necessity for a general diffusion of sanitary knowledge, I was led to follow up the declarative resolution in regard to the establishment of illustrative museums, already referred to, as having been adopted at the Congress d'Hygiène in 1852, by proposing at the Congrès International de Bienfaisance, held in Brussels in 1856, the following resolution: "The Congress declares that it is of public utility that the working classes be enlightened by all possible means in regard to the improvement and keeping of their houses in good order. It declares that the instruction of the young in the labouring classes ought to comprise all which relates to the benefits resulting from good ventilation, and the evils resulting from humidity. Lastly, it thinks that the study of the science of preserving health is one which ought to be rendered accessible to all." The unanimous adoption of this resolution by the representatives of upwards of twenty different countries, recognised the wide-spread extent of the ignorance referred to, as well as the serious nature of the evils resulting therefrom.

Amongst *individual* efforts for promoting the object under consideration, the prominence given to it as an object of vital importance, in public addresses by many distinguished statesmen, ought not to be forgotten; those of Lord Palmerston have justly carried with them all the weight and high official influence of Prime Minister.

Within the last five years many Ladies have directed their zealous efforts to objects which tend in various ways to domiciliary improvement. The Ladies' Sanitary Association, the Female Domestic Mission, connected with Bible colportage, and Meetings for the Instruction of Mothers, exercise a highly beneficial influence in this respect.

Notwithstanding, however, all our recent ameliorations* it is

* The beneficial results of sanitary improvements effected within ten or twelve years in several of our large towns are manifest from the following returns, out of nineteen which have been obtained. In the metropolis the death rate has been reduced from 25 in 1000 to about 23; in the Liverpool district, from 39 in 1000 to 26; in the Bradford district, from 28½ in 1000 to 20; and in the Croydon district, from 28 in 1000 to 21. Knowing, however, as we do, that the normal standard is certainly not above 17 in 1000, these results are a proof of our responsibility, as well as an encouragement to perseverance in the discharge of duty.

a well-ascertained fact that tens of thousands of human lives are sacrificed annually in Great Britain through ignorance and the culpable neglect of means within our own power. But, owing to the noiseless and almost imperceptible way in which such multitudes are carried off by preventible diseases, and their homes desolated, we witness no manifestation of the practical sympathy so justly shown by the public, when, through some lamentable accident, a score, or perhaps hundreds, are suddenly deprived of life, and their families of the means of subsistence.

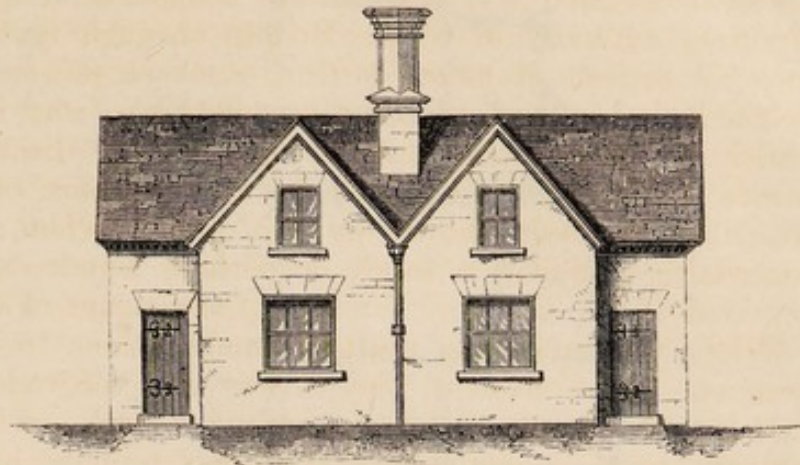
When recommending sanitary ameliorations to influential persons on the Continent, the misery and degradation in which vast masses of our fellow subjects are sunk, owing, in a great measure, to their domiciliary state, has been so often pointed at as a reproach to England, that the words "Physician, heal thyself" have frequently occurred to my mind, as a call to renewed exertion for this object.

And now, in conclusion, if the remarks offered and the facts stated have tended to show that it is not through the exclusive adoption of any one of the means which have been pointed out, nor by any infallible specific, that the benefits of a healthy dwelling can be extended to all classes of the working population, I yet entertain a sanguine hope that through the general and earnest adoption of a combination of suitable measures, existing evils will be greatly mitigated, if not entirely rooted out. Such an expectation is warranted by the well-known results of the improvements in our prisons, which are no longer hotbeds of fever and of moral contagion as they formerly were. Whilst the ameliorations very recently introduced in our military barracks and hospitals have led to a diminution by one-half in the mortality of their inmates, as was lately stated by the Chancellor of the Exchequer.

Encouraging facts like these should stimulate all to exertion in their various spheres of action, in order that the labouring population may, to apply the words of his Royal Highness the lamented Prince Consort, adopted for my motto, participate "in the blessings bestowed on us by the Almighty," but which, in their case, "can only be realized in proportion to the help which we are prepared to render to them."

In illustration of some of the preceding suggestions, two pages of wood engravings are added. The *first* may be useful, in regard to the dwellings generally of the labouring population who are not confined in towns. The *second* is more particularly designed to show an adaptation of the open Gallery System to town buildings, in a way which is but of recent introduction. The arrangement of the lower plan will admit the occupancy in sets of two, three, or four rooms,

*A pair of LABOURER'S COTTAGES, combining
the Essentials of a Healthy Dwelling, as described at f^o. 9.*

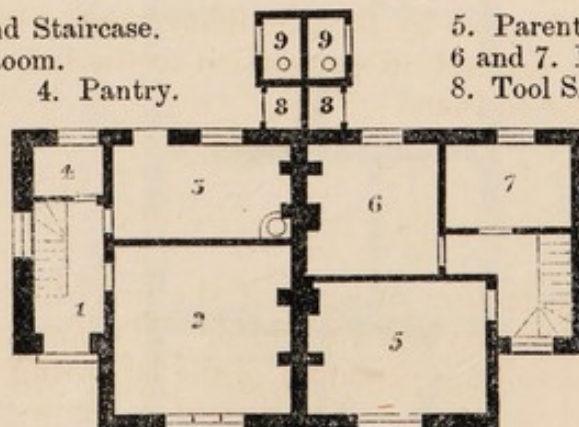


Elevation which admits of more ornamental details.



Elevation of the most simple character.

- | | | |
|-------------------------|------------|--------------------------|
| 1. Lobby and Staircase. | | 5. Parents' Bed Room. |
| 2. Living Room. | | 6 and 7. Bed Rooms. |
| 3. Scullery. | 4. Pantry. | 8. Tool Shed. 9. Closet. |

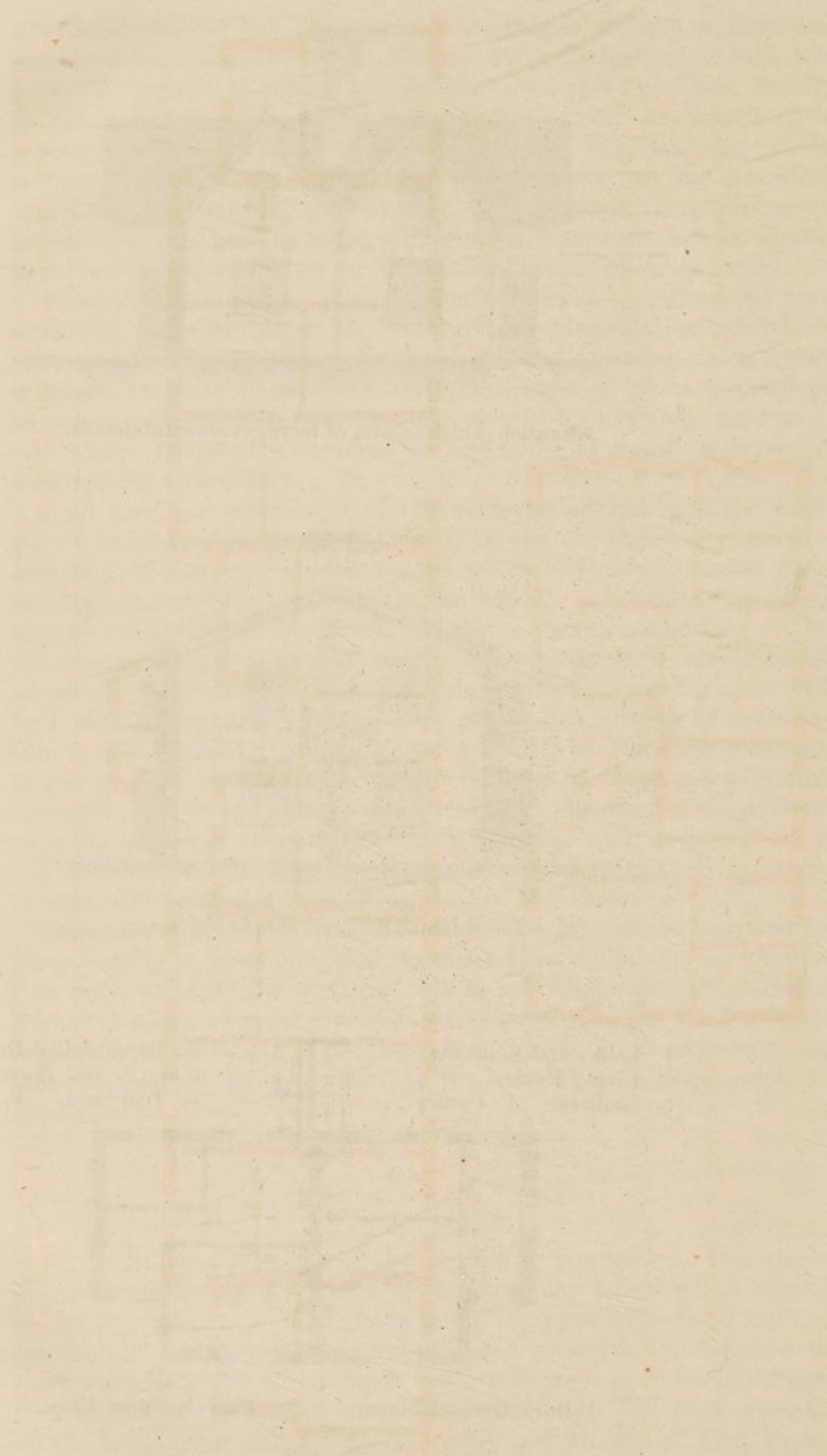


Plan on Ground Floor.

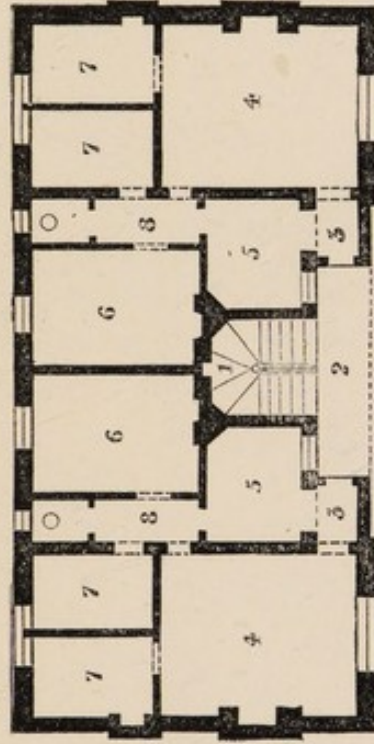
Plan on Upper Floor.



THE UNIVERSITY OF CHICAGO
LIBRARY



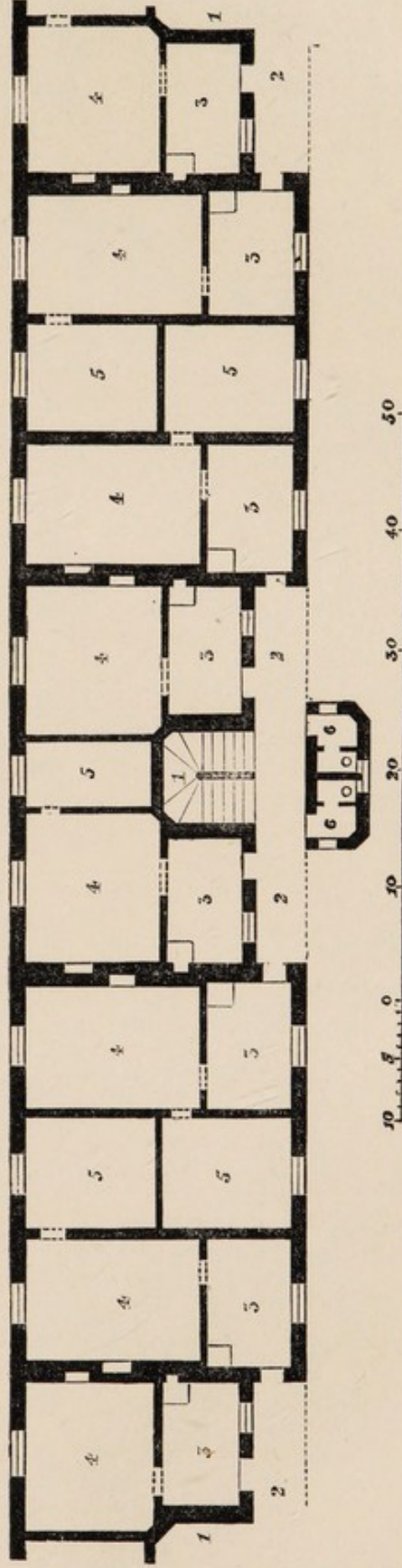
Plan for WORKMEN'S DWELLINGS IN TOWNS, being a Modification of those exhibited by H.R.H. the Prince Consort in 1851.



1. Open Staircase, with Dust Shaft.
2. Open Gallery.
3. Entrance Lobby.
4. Living Room.

5. Kitchen with Stove.
6. Parents' Bed Room.
7. Children's Bed Rooms.
8. Passage leading to Closet.

Plan for DWELLINGS IN LARGE TOWNS adapted to Families of the Lower-paid Class of Working People.



1. Open Staircase.
2. Open Gallery.
3. Kitchen Entrance, fitted with Stove, &c.

4. Living Room, with space for Bed.
5. Bed-Room.
6. Lobby to W. C., and Dust Shaft.

In the Kitchens of such dwellings on the Continent, instead of brickwork under the Windows, the space has been filled in with ventilated Provision Safes. The Cooking Stoves also are compact and economical.

The first part of the report is a general description of the
 project and the objectives of the study. It is followed by a
 detailed description of the methodology used in the study.
 The results of the study are presented in the third part of the
 report, and the conclusions are drawn in the final part.

