Title of Thesis

"The Effects of Smoke on the Health in a Manufacturing District"

April 1885
Circumstances affecting Health in a Manufacturing District

Smoke, Smell, Noise

Thesis

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April 1885.
Henry Jordan on circumstances affecting health in a manufacturing district.

A few these giving an account of the Jerusalem microbes at Cheorkeley.

Like many anecdotes in factory journals it perhaps rather overstates the bad effects.

It may be regarded as $S$. 
Smoke, Smell, Noise

In almost all localities, but
more especially in the neighborhood
of large Manufacturing Cities, it only
requires to glance the eye around us
to discover at once fertile sources of
disease. Not only will never be
known how far the deathrate has
been influenced by such causes.
Civilization has made such rapid
strides, that it has succeeded in over-
turning the equilibrium of Nature,
and, at meantime, seems to be one of
the unavoidable penalties of Civilization,
that we should live under an
awesome condition of life. Never-
theless, it is truly one essential and
chief part of our duty, as Cultivators
of the noble Science of Medicine, to
prevent, as well as to cure disease.
For these frequently are sources of disease
in a district overwhelmed our neglect;
and how much in the degree have
The health and comfort of a community have been found to correspond to the community there existing the principle of an unceasing health, in respect of disease immunity from disease, and so long as an uninterrupted calm is enjoyed, the idea of a possible coming storm seldom occurs.

Here is a strong feeling abroad, that legislative enactment is an aspect of doing service in the preservation of health and the suppression of disease. This may be the case, but the Act seems to be, that Act of Parliament, when put into execution, turn out in the end too, at least, merely permission. Be this as it may, I cannot be shier that, by legislative enactment and their advocacy by the press, sanitarians are now being listened to by the public, and their teaching is at least beginning to convince the nation that “There is no virtue like necessity.”
Under the most favourable cir-
cumstances, sanitary reforms is
uphill work. But in a manu-
facturing district, it must be very
gradual in its development to be
safe in its course. It must be
founded on actual knowledge, and
must be taught to, and understood
by the masses in a systematic,
definite and comprehensive manner.
They must especially be taught, that
the art of preserving health cannot
be interfused with leg questions of
social kind. They must be taught
that disease appears through a
well-defined series of causes — causes
in many instances, recognizable and
removable, but in many instances
also obscure. It is only by tracing
out and suggesting means for the de-
struction of these causes, that the
sanitaryians of our day can add
their quota to the advance made
in the knowledge and appreciation
of sanitary matter, during generation.
peak - advances which, especially
during late years, have made such
capsule strides, that even we, of this
century, are entitled to picture to
ourselves the time when men shall
live in perfection of sanitary splendor
—the glad days of universal health
and happiness sung of by Virgil;
the days of perfect regimen taught
by the illusions Helen; or such
time, as Plato pictured, when the
people taught that, by careful management
and purity of life, physicians and
things were alike unnecessary, was
rather that the very existence of such
a community was only a proof
of the vice of the people.

The regulation of Public Health must
not be looked upon as of modern
origin. When we look back into
early history, we find this a subject
of legislation. The Mosaic Code of
Law—the most ancient in record—
contains minute directions for the
cleanliness of the Germans, the puri-

ification
further use. In the reign of Queen Elizabeth, it was again made a question of legislation. From this period down to 1819 scientific men, at intervals, of about 50 years, protested against the smoke nuisance and its evil effects on life and property. In 1819 it once more became a subject of parliamentary discussion. Indeed, however, of prohibiting the use of Coal, a Select Committee of the House was appointed to inquire whether Means could be devised to arrest offensive & prejudicial to public health & comfort. His Committee reported that the nuisance complained of “might at least be diminished if not altogether removed.”

In 1843, another select committee was appointed to inquire “into the means and expediency of preventing the nuisance of smoke arising from fires or furnaces”. They recommended that a Bill should be brought into
Parliament to prohibit the production of smoke from furnaces and steam engines. From 1843 to 1845, such eminent scientists as Faraday, Sir Lyon Playfair, and Sir Henry de la Beche reported that the continued emission of smoke is an unnecessary consequence of the combustion of fuel, and that, as an abstract statement, it can be dispensed with. Only sanitary reform as to smoke nuisance has been slow in its development, but, it has also been slow in its course.

The scientific and technical knowledge has advanced pari passu. Public interest has at length been awakened to the question of the evil, and its demerit to some degree; the prevention of smoke is recognised as a matter, not only of public importance, but one of material interest; so that, sooner or later, this nuisance must be swept away by the breath of public opinion.
We wait now for some systematic procedure on the part of the Government to carry the scientific investigation, which has been fitfully carried on, during the first six hundred and fifty years, and which, since 1845, have been pursued so industriously and successfully.

Although smoke, smell and noise are nuisances and injurious to health, within the meaning of the Public Health Act, yet the law as at present administered, being inadequate to impress the Sanitary With it, is intended to destroy.

Local Authorities, as a rule, are indifferent or remiss in regard to the great hygienic laws which ought to govern every well cared for district. They are too much under the influence of the manufacturers, who create these nuisances, to take the unpopular course of prosecuting; and though the inhabitants of an affected locality are permitted to institute legal proceedings,
few of them are really independent enough of the trade, in the district in which they live, to adopt such a course. The result is, that nuisance of the kind referred to, are allowed to flourish for a long period.

With the powers that be, there is often the feeling that legal proceedings against the authors of such nuisances would be an undue interference with the liberty of the subject, or the rights of property and vested interests. This feeling tends to the abuse of the liberty of the subject.

In every evil, danger or abuse the law has ever sought to put an end to. It is a well-known fact, that the very foundation of society and liberty, as distinct from the license to injure, is the relinquishment of many individual rights for the common good. The force of this is indeed fully exemplified in the military de-

struction.
Restrictions under which man is placed, both as regards the construction of his body, and his commerce, and in respect of infections, diseases occurring in his household, as well as those matters, which do less affect his neighbour than himself.

So long as the health of the one individual alone is concerned as in disease, which are neither infections nor Contagions; each one may claim some large disjunctive right to determine whether the one or the other be kept preserving, and to decide to the State, or others, the power of deciding. So, though a man can tend the producer from poisoning himself by an excessive production of smoke, if he chooses to allow the chimney of smoke downward into his own apartments, he can have no right, either legally or morally, to poison the atmosphere inhabited by those who have the misfortune...
is seen in close proximity to them, endangering their health or life, and interfering thus with the interests of the community.

Not only as our technical and scientific knowledge advances alongside of our industrial progress, self-interest will do more to check these evils than any compulsory legislation can effect.

Already some manufacturers are beginning to realize the force of scientific conclusions; and, acting upon them, have altered their general methods, to suit any of the little productions of Smith, with great profit to themselves and comfort to their neighbours.

It is authentically reported that the whole of Dupont's recent great pottery and porcelain works are being conducted practically, entirely Smith, and at a saving in fuel and labour amounting together to about 40 per cent. A careful account of about 5000 firings, under the new system

Shewing a saving of about 20,000 tons of Coal, of the value of up
wards of £10,000, and in addition
to this, there is a saving in wages,
and a better production of work.
Again, the same report says that
steps toward, pueden, wos United
the operation of their business with-
tself, save by that means, in the
Coal of Coal £266.66 annually. This
would points to an immense loss
of heating material. The question
arises, What does become of it?
However, there is a very complex
substance; but putting aside its re-
classical and abstractions, in products: Carbon
Hydrogen, Oxygen & Pyrolysis may be Ex-
cluded as its ordinary and essential
constituents; indeed for all practical
purposes it may be regarded as one
purer excluding of Carbon & Hydrogen.
The Constitutive Constituents
of Coal in passing through the furnace
and flaws of a boiler, are Constituents:-
1. Steam—lighter in density, moisture, and in combustible
2. Carbonic acid—invisible, not combustible
3. Carbonic acid—visible, but combustible
4. Strobe—visible, partly combustible, partly in combustible

Whenever, during combustion, portion of the constituent elements of coal gas—
Carbon + Hydrogen—fail to combine with Oxygen in the ratio of 1:4, Oxygen to convert
them into Steam and Carbonic Acid,
Steam is formed.

Oxygen forms one-fifth of
the volume of Air. It will therefore
require five volumes of Air to pro-
duce one volume of Oxygen. But
Coal gas requires two volumes of Oxygen
as its Saturating Equivalent; therefore,
for the same purpose ten volumes
of Air are necessary to provide
these two volumes of Oxygen. That
therefore, sufficient air be introduced
(by ten times the Saturating Equivalent
of the Coal gas consumed) then the
Hydrogen takes up its Equivalent.
Try to form Steam, and the Carbon to equivalent O2, dry gas to form Carbonic Acid. In this case, perfect combustion must take place, and no smoke forms. These substances would constitute invisible and incombustible gases and vapors and would therefore escape from the chimney-top and thus with the atmosphere instead of being consumed; and which is of more importance, without the being deleterious. But it unfortunately happens that, from the manner in which Coal is burnt to combustion is far from being perfect, and that besides the above mentioned products, inflammable gases and vapors, together with large quantities of very finely divided Carbon, constituting the Black soot or smoke, are emitted forth from the chimney shaft, not only Contaminating the air, but also occasioning loss of fuel. For, Short the Saturating Supply of air the demand to meet. It is admitted during Comb. —
of coal, the hydrogen, possessing a great affinity for oxygen than carbon in the gaseous state does, will take up the oxygen and separate itself from the carbon; and the carbon, losing its gaseous character, would return to its natural and elementary state of a black, pulverulent and finely divided body. The amount which would be, of course, in proportion to the air supplied.

Carbon, however, may pass off in an objectionable form otherwise than as soot. It may escape and does escape largely as carbonic oxide. The inference from this statement must therefore be, that combustion without smoke does not indicate perfect combustion. But it does not prove however, that because there is no smoke, no carbon can therefore be escaping. It is only when carbon passes off in the form of carbonic dioxide, that perfect combustion has taken place. Carbon in the shape of carbonic oxide
is lost in the following manner:—The air, on entering the furnace, in a file, once dryer upon the glowing fuel, starting to dry and forming Carbonic Acid, thus generating much heat. This Carbonic Acid, now at a very high temperature, has to pass upwards through a body of incandescent Carbonaceous matter, and in doing so, takes up an additional portion of the Carbon and becomes Carbonic Oxide.

In this manner not only is heat lost, but also the portion of Carbon taken up during the conversion of Carbonic Acid into Carbonic Oxide. Hence, instead of one portion of Carbon (as CO₂) escaping, two portions (as CO) escape. And, therefore, it has done half the duty it was capable of as a fuel, as compared with the more highly oxidized Carbonation of Carbonic Acid. Thus proving that the less of duty on the part of Coal, taken as a whole, might easily
In a degree of 40% less, as demonstrated by Mr. D. H. Clark.

The mixture is a ready process, by a supply of air. Energy, then, is required for perfect combustion as it is by a deficiency of air. In the latter, oxygen is deficient for completing saturation equivalents. In the former, a lowering of temperature results, and as a consequence of this, the non-unition of the various constituents in the gas. So the burn is then the former.

The same thing is observed during and shortly after feeding a highly-burning fire. By this operation, the temperature is lowered by the coke absorbing the heat of the furnace during the process of its own volatilization. The carbon (as in the case of excessive supply of air) coal is half burned. This, of course, means, imperfect combustion, and therefore smoke.
Generators by the action of heat on Coal, in order to perfect combustion, must be mixed with air. So that by virtue of a due supply of Oxygen, they may be made to burn with flame, and become entirely converted into combustible and transparent invisible vapors, and gases, instead of being, as they were, only partially burned, then Carbon being precipitated and escaping together with the other imperfectly consumed matter into the air. This can only be accomplished by (1) a high temperature within the furnace, (2) adequate time for the operation. Such a circumstance, however, would cause 40 per cent in fuel and labor, not to mention damage to property caused by smoke. The 40 per cent saving is accounted for thus: (1) less Coal used, (2) less labor in handling, (3) Coal & Cartage therefore less (40%)}
the imperfect Combustion of Coal.

The Carbon escapes, + its heating value is Thence lost (5) and 0

further heating value (from Heat of

Carbon) by the Combustive gases in

black Smoke, and (6) is 0. Still

further heat which escapes unavailable from the defective method

of Conducting Combustion.

It is urged by Modern Authorities, that the Combustion of Smoke is

not economical because the excess

of air which it is necessary to

introduce through the fire to effect

the Combustion of Smoke, has to be

heated, and the heat so applied,

more than balanced, that produced

by the Combustion of the Smoke.

As regards actual Count of Smoke, the Solid Carbon in which does not

exceed 1 per Cent. of the Amount

in the fresh Fume. This view may

be Correct, but the Completion of

the Combustion of the insoluble Carbon

present in the Gaseous Products
As Carbonic Oxide or Hydrocarbons is certainly chemically.
Nitrogen during combustion, seems to have no earthly function. It escapes, unlike carbon, and to assist its escape, it must absorb heat. Then, it would appear that Nitrogen is, if anything, a heat absorber. But it also helps to contaminate the air, for a portion of it combines with the Oxygen and forms Nitric Oxide.

In thus considering the interest of the manufacturer, those of the Community are steadily held in view. The injury to health from the fumes of Smiths' belching from factory chimneys cannot easily be estimated in words. We have to accustom ourselves to all our days that we are almost afraid to say that Smiths, bounded only by the walls of heaven, is injurious to health. It may perhaps be used to say that we have experienced any direct inconvenience from the Smiths of factories; and we have
So much of vital organs and the
ind effects of any injury to them,
that we are in danger of dis-reg-
arding as unimportant all minor
deviations. Yet from these often flow
the beginnings of serious maladies.

It is true that, during life, the body
is a whole and the several structures
which compose it, possess such a form
of resistance, that exposure to various
agents of various kinds does not produce
any sudden and striking mischief,
neither does it always or usually
result in the manifestation of disease.

It does not follow that because pain
or discomfort is not always in-
ferior or a vitiated atmosphere,
no harm has been done. The effects
may be slow and imperceptibly cum-
ulative, but they are none the less
injurious. May rather on that account,
may act as fertile and widespread
pre-disposing causes of disease.

Reducing disturbance of the system
a vitiated air sooner or later under
Health and Strength.

Carbon in Know or air imparts form, emission of every kind and name beyond the reach of reaction from manufacture, and the infinite series products of natural or artificial change. These both connect, pass into the air, on the one hand, whence, in spirit of the exquisite arrangement in the pulmonary to their junction, substance, as well as for the filtration of air, they find their way into the tissues, where they become permanent lodget, or, on the other hand, they amalgamate with the water (which in league with unnatural substances has developed each an affinity for various matter) to their get into the system through the stomach.

A saturated atmosphere endures on the close of each constantly floating about in the air — each grain of which from a nucleus or which the vapour of the saturated atmosphere endures, and so in thus formed.
But these are ill, and own, sir. Our rooms are dispelled by heat. The heat of the fire in the room. The fire in the room. The fire in the room. The fire in the room. The fire in the room. The fire in the room. The fire in the room. The fire in the room. The fire in the room.

The lattice, from the fog, will not make the mist, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, however, howe
into our streets and gardens, and their
murky thickness is an atmosphere
already repulsive to the healthy nerve.

In a manufacturing district how-
ever, where the trade is so various
as in the locality I write in view,
we are independent, so to speak,
of the naturally settled condition
of the atmosphere to endure the smoke
particles, dense, and thus cause them
to fall; for as will afterwards be
shown in this paper, steam and
hazes of various kinds are conducted
by all manufacturers into their
respective chimney shafts; sufficient
of themselves, to render the smoke
particles not only dense but the
atmosphere poisonous. This will be
referred to under the chapter Smell
of this thesis.

Another fact related on experiment
in connection with smoke is, that
air efficient for supporting healthy
life must be rendered active by the
presence of Ozone. The permanent
Absence of fumes from the air distinctly证明s, be regarded as a proof that the air is ad
tually free from air, and thus reduced in actual power to purify the atmosphere and
neutralise its poison, as they are
penetrated. Experiment has proved
that fumes are rapidly destroyed by
Smoke and other impurities which
are present in manufacturing
districts. This is one of the proof
of the injurious effects of Smoke,
and it will no longer do for us
therefore, to permit the air to breathe,
under the prevailing impressions that
its purifying properties are non

If it was practicable to totally
prevent the formation of Carbon in
a final, divided state by perfect
combustion, let their still sulphur
or their Carbonic Air, or Carbonic
Acid be used with. These gases
remain in the air as plentiful
as soon as Spirit of Perfect Combustion
is used.

2 Par.
The combustion of 1000 tons of coal gives 15 tons of sulphur as sulphuric acid. Coal in Glasgow gives off annually 2000 tons of sulphuric acid, and in London the 5000,000 tons of coal burned gives 75,000 tons sulphuric acid.

Dr. Frankland says: 'And vast aggregate quantities of coal-tar and paraffin oil are daily distilled into the atmosphere from our manufacturing plants. Condensing upon or attaching themselves to the water drops of fog or cloud, much of necessity coats the latter with an oily film, which would retard the evaporation of the water and the consequent saturation of the interstitial air.' And 'that the presence of liquid hydrocarbons in a different condition—resulting from imperfect combustion—would tend to explain the frequency, persistence, and irritating character of the fogs which affect our large
from, inasmuch as some of the product of destructive distillation of coals are very irritating to the respiratory organs.

Now it would appear, that we turn one Coal, not only at Sluice doors, but convert it into a dangerous thermo-clinic irritant.

Dense Volumes of Smut, constantly wafting away, act also as interceptors of Sunlight—an arch potent purifying Agent of air.

Last but perhaps not least, this Perpetual Showering of Smut or Dust in the Vicinity of Factories, naturally precludes Ventilation. Now any circumstance that interferes with Ventilation, must certainly deteriorate Health and Strength.

It may be concluded then that Smut, by the irritating Particles suspended in it, is harmful to the Respiratory Organs, that the Force & the General health is thus impaired, that the Brightness and true an eye
of Spirit, which contribute so much to the sound and sadness of life, are thereby diminished, and that in thus defeating the vital powers, it is a source of danger, by lessening the body less apt to resist attacks of disease. As so long spirit and spirit are indissoluble, under the Nervous System must therefore become depressed, and thus the moral as well as the physical health is injuriously affected by this smothered atmosphere.

Smoke alone is a nuisance within the meaning of the Public Health Act, and injurious to health. Alone it is bad enough, but consistent with smell and noise the case becomes simply intolerable and should be abolished.

As smoke increases, it is not only injurious to health. On the same reason, if for no other, smell is a nuisance and injurious to health. But there are other reasons...
that determine the prejudicial effect of smell.

In a district where the manufacture of
lindane is the leading industry, smell is even more
potent as well as more offensive than smoke.

If smell has been used all
one day, and one progression in for-
wards towards its increasing pro-
gress in relation to us, has been so inciden-
tial as to make it every thinking
man feel its harmful influence on
health. Not so with smell—especially
such an offensive smell as emanates
from the manufacture of lindane.

In the manufacture of
lindane, various gases and vapors
appear to arise from substances used
during the various stages of the opera-
tions. These stages are:

I. The distilling of linseed oil
II. The clarification of meal oil
III. The preparation of the cement
    and dressing composition
IV. The drying of the dressing com-
    position
The gaseous emanations given off by these processes are all more or less offensive and injurious to health.

I. Boiling of the Linseed Oil.

The fumes evolved from the boiling of linseed oil which principally affect the senses are:

1. Acetone, which is a vapour irritating to the eyes and nose and mucous membrane generally.

2. Linoleic Acid which is an oily vapour but slightly soluble in water and having a strong acid reaction.

These fumes, escape in fact are conducted into the chimney stack and ascend with the smoke to the detriment and annoyance of the surrounding district, near and at a distance.

Sheds the atmosphere as heavy. The gaseous emanations proceeding from the chimney stack will descend at no great distance from the point where they are given off and
must then be decided by an unequal offensive. Even under ordinary atmospheric conditions, when they may be carried 8 or 9 miles distance and although they may lie as well as dilute with air, as to render them inoffensive to the senses, yet the air thus diluted is by no means pure air.

To prevent any such gases given off from boiling oil containing, or they do, acetic and other acids, it is not advisable to heat them into the tubes over the fire, as they speedily condense the boiler plate. In the boiling house, the fumes quickly condense into fumes. The mixture of these vapours with air in certain proportions is explosive. This state of affairs should be obviated by the fumes being taken away or burnt. In turning down, we would have the usual products of combustion, which have already been shown to be injurious,
health, and in such a case as this, Conspiring clearless as it would be odourless.

It must be left to others to say here this condition & & be remedied. The Oidation of the oil.

It is chieflily vapors from the distilling buildings that give rise to the nuisance complained of in the neighborhood 7 7 7

During the process of Oidation of the oil the fluxes of certain are so irritating as to render access difficult until they have been removed. Efficient means of Oidation must be provided. Attempts have been made to pass them through a fire, but the great bulk of air which has to be treated with them, and in a short space of time has tendered these rudimentary smelting. As in the preceding process of oil boiling, the only remedy which has met with some partial success, is that of freezing.
There is a high draft into the atmosphere. This is in the immediate vicinity and may be detected (according to conditions of atmosphere) but certain is the expense of those living at a great distance.

The vapors given off by the oil during oxidation have been found to injuriously affect not only textile fabrics, but also wood, linen, and cotton. During oxidation, the boiler oil gains 11 per cent in weight. The amount of dry gas absorbed therefore, must be large, and indicate the necessity of a plentiful supply of air in the oxidizing building. Ignit wind the vapor, more particular and to operate in the building. Nevertheless the fact is worth notice on account of its bearings.

III: The preparation of the Cement

This consists in mixing and heating the boiler oil with a certain proportion...
of relaxing and raisin juice, in a pot with a steam jacket, for a few minutes, and pouring out the mixture into a trough upon the floor. During this operation, an acrid irritating gas is evolved and having a powerful irritating action on the mucous membrane. This pungent vapour consists of carbonic acid, which is, in this case, drawn into the chimney stack, and thence into the air before the pungent gases have been absorbed (chemically).

To lay the entire backing composition.

This process gives off a decided sickly oily smell, but has not any pungency in its character and may therefore be deemed partly, fully by the foregoing paragraph.

It may be fair that these vapours are deadly diffused in the air as they are emitted from the chimney; but it is contended
That this diluting action of the Air is not rapid enough to avoid the injurious effects of those noxious gases, before they have made their mark on the neighbourhood.

Such excavations are sometimes carried a great distance before they become so dilute as to be offensive to the senses, on the one hand, or finally descend and settle, on the other. For example, Shale works, six miles distant, fill houses in this district, shatter the walls, blow down lint and garrets, with their abominable smell. Not only so, but I have frequently observed the edges of a large lake, in the out-shoots of this town, covered by a thick oily film - the result of the volatile elements generated by these Shale works. This is an important fact and bearing heavily on the diluting power of Air in the case of Noxious Excavations.
The Stove alone, be it little or much—
ispect of the atmosphere in a state
of saturation—which passes up the
chimney shaft with those oily vapours,
is sufficient to bring them down more
readily than if they were alone.

Swell, whether offensive or the
opposite, indicates atmospheric impurity,
for gaseous emanations, and fresher air
are not, and cannot be consistent.

The oxygen of the air is taken up
by the porous matter, whereby the
air is thus rendered impure.

There can be no doubt but that
one of the principal objects for which
the cause of smell is given is, to
detect atmospheric impurities. All
odorous gaseous may not be partial
or directly deleterious to health, nor
may all poisonous gases be odorous.

The nature of odorous eman-
ations is so little known that it is
scarcely possible to give a definite
account of the mode in which they
produce sensory impressions, which
hi how are transference 2 the inner
bod of our brainness where they
are per ceives and guessed.
From the fact that most odorous
substances are volatile, or vice
versa, it may be presumed that
they are to particles of jntuse
mixture's discribed in the air.
Before the odorous matter can be
immediately applied to, or affect the
olfactory nerve, they must be discribed
in the mucus of the human's membrane
of the nasal cavity. Shuld there,
the membrane of the olfactory nerve
be in an unhealthy condition, smell
is impaired or altogether lost. The
membrane may, for example, be too
dry, as in the first Stape of Cataract,
so there may be an inordinate se-
cretion 2 fluid from its surface, as in
the second stage of Cataract, and thus
prevent the necessary penetration 2
the Stimulating odours to the neuron
filaments.
During a general illness, or on
Sundays. The work all goes on in
operation. Why is it that sensations
of these odors continue after the
impression of the odorous matter
is over? Possibly because some
of the odorous matter still remains
in the nucleus of the medulla.
Probably an excessive stimulation
of the nerves produces an excessive
stimulation of function and an
excessive flushing of the olfactory
center—local hyperaemia. Thus by
the continued action of smell,
a chronic narcotic condition of the
nose must result—in fact,
disease.

The irritating fumes part nature
of the gases and vapors, already given
to, seem to affect the nucleus or
narcotic of the olfactory region—especially
in the case of those employed in the
manufacture of dyes, etc.—very much
after the fashion of tars and.
Their sense of smell becomes first in
pairs and then gradually lost.
Seems specially the case with the most men who live on the premises, for I have heard them constantly declare before the Sheriff, that they own experiences any odors proceeding from those works. It has been, so to speak, their native air. This may be so, but do they on that account breathe pure air? Is it for it come to pass that adulterate air is as healthful as pure air? And is it the case that because I am unconscious of feeling any impure air I am proof against its influence?

I am quite aware that odors are pleasant or offensive in a collective sense only. This is especially true of the town animals, but it is also frequent of cows amongst men. Many odors thought agreeable are loathsome to others; and the sensations derived from the same odors, as substances are differently described by different persons.
As with the Eye, in Case of Certain Colours, so with the Nose, in the Case of Certain odours — with some it is instinct — Different Men to possess different degrees of Perception towards, with regard to Smell.

Case of a bronchial Caractar, in the vicinity of these works, have been very frequently under my care, and I have observed that when the wind blew from the direction of the patient house against the factory, the patient was comparatively better. In that case we were able to open windows, or doors to ventilate; whereas, in those cases where the patient suffers, and for want of fresh air, in some instances, yes. This was especially observed in the case of Children. It was found that, as soon as door or window was opened for ventilation, the room filled with the sickening smell, and this little one became overpowerd. Its digestive was upset and for
Some time it was made to assimilate food. This, I was assured a few days ago by a colleague, was also the experience.

For some time past I have had under my care a patient living near one of those factories, suffering night and day from smell, to of appetite, nausea, sickness. I sent her away from the abating nuisance for a period. During that time she was well and in perfect health, but on her return home the old symptoms also returned. She was sent to the country a second time, though on this occasion the symptoms were of so serious a nature that I was apprehensive of the probable necessity of painting, along with an [inaudible] Medical man. Certificate for her removal to a place where she could be quiet by [inaudible]. Removal for a time from the nuisance, however, the desired effect.
Such places really become the centers of disease not by necessity, as is commonly supposed, because the inhabitants are conscious of an "smell" but because the air they breathe is reduced in active power and poisons are being generated around them to which they are constantly exposed and before which they fall a prey.

A deterioration of property in the neighborhood of limekiln works must, apace; but the bearing of this on health, conceding the few proprietors around, and only therefore but involve the question of the influence of dines on health - an important factor over. Nevertheless, and can only be included under moral responsibility.

Latter than legal jurisdiction.

Noise, like smoke, is common to every factory and works shop in this district. We have noises of every degree of intensity.
Some are loud and clear, then quiet and imperceptible. Some are constant and regular, others irregular and intermittent; some begin at certain times and cease at certain times; some begin at irregular and cease at irregular times, giving rise to a sense of impatient expectation or the one, or subject the mind or attention to a series of successive shocks or the other. Each class may be fairly assumed to act as irritants to the nervous system.

Blackstone gave as his definition of a nuisance "Anything which works hurt, inconvenience, or damage." Bell in his "Principles" says "whatever is noxious or injurious, or renders life uncomfortable to the public generally or to the neighborhood, whatever is intrinsically offensive to individuals in their dwelling houses, or inconsistent with
the Comfort or the Whiteness by Stench,
as the Biding of Whirls by Water—by Noise, as a Smithy in an Upper
floor is a Nuisance.”

As the Nutrient and
Structural development of Muscle
is determined by Exercise, so also is
the Nutrient and Constructive deve-
lopment of the Nerve Centres
which govern the various senses,
determined by Exercise. Every
impression made on the Auditory
Nerve is thus matter to the Centre
of Audition whether that Centre
take cognisance of the communica-
tion or not. And as the growth
and development of a Plant is
determined through and by the Soil
in which it is planted, and as its growth and development may
therefore be interrupted or prevented
by—through the Soil, so with the
nervous system. Its Centres of
Receptivity are determined, as also
their Nutrient and Constructive develop-
ment.
by their several Accessorys for soft or firm Soil. Thus whether abnormal noises are perceived or not by the inner Consciousness They irritate and disturb. Function is abnormally Stimulated, giving rise to local Hyperaemia — a condition which interferes with the Normal Nutrition development of the Nerve Cortex. Thus a Continuation of Such a Condition generates a Morbid State of Staining which comes or late gripes into disease.

Loud and Acute Noises, such as those produced by the Steam trumpets or Steam Whistles, as largely used as Signals for summoning work people & their children. Shock and wrong the Nervous System.

Trinding Noise, again, such as are produced by the action of Loader wheels one upon another initiate and worry.

Such noises as are Regular and Constant, are perhaps more tolerable
Tolerable than any other noise, but they have a more prejudicial effect on the nervous system, as in a comparatively short time, by their continuous disturbance, an abnormal condition is substituted for the normal— and therefore a months worth. This condition may become a habit—an abnormal habit established in the nerve centre. So much so, that when the noise ceases, or the person affected removes from the noise, he feels as unhappy as if he were without the noise as he formerly did on account of it. In such a case known there is only a condition of mental disordered and accompanied by the nerve destroy my agent.

It is a well known fact that one accustomed to an eight-day clock ticking loudly in the room, would grow to sleep in spite of the sound. Notwithstanding, and that the moment the clock stops ticking, he wakes.
was then up. The reason of this is that the stimulant whereby this morbid nutrition process has been maintained to the pitch of rhythm has been removed. Thus disturbing sleep — real sleep induced under abnormal conditions.

As exercise (normal) is keaper to the healthy condition of nerve centres, so a stimulant — that same stimulant which had been the origin of all — is necessary for the maintenance of this habit and rhythm generated by morbid nutrition processes. The same is true of the child accustomed to be rushed to sleep by the monotonous tune of pianino song of the nurse. Long after it has fallen asleep the child will awake as soon as soon as the music stops. This is a habit — an a morbid condition (rhythmic) of the nerve centre to boot.
The Medical Journal some time ago I read of a case of a porter of the Attendants of a Pullmans Car, Traveller every alternate night from London to Glasgow, and the next from Glasgow to London, sleeping during the day, when in Glasgow, in the Car, and when in London at his home. When at home, his sleep was torpid and restless, owing, he explained, to the absence of noise to which he was accustomed. Noise, interrupted and irregular, differ in their action on the Nerve, from those affected at regular intervals, in so much as they do not create dangers as the nervous tissue already referred to. Yet they subject the Nerve to excessive shocks and in this manner exert some influence. In addition to this, the State of Expectancy set up in the Brain by their irregular character is painful as it is injurious.
Have you the profound sense of noise acting on quietness—the one arising in the inner consciousness itself, producing local hyperaemia, and then the formation of a cutting, interrupting normal nutrition. Thus then noise is beyond doubt an exciting factor in the production and determination of disease. Many organic disease—by interrupting nutrition it destroys structure, by destroying structure it produces organic disease.

Noise is a most annoying form of nerve irritation and a trouble—some forms of irritation; a serious source of inconvenience, loss of rest and loss of health to many; and serious injustice, the satisfactory progress of the sick. Notwithstanding standing all this, it is a form of annoyance in danger to health and life, which it is difficult to have the law to condemn as a nuisance or legal offence.
Note. In connection with the manufacture of lintums, one
might refer to the clouds of coal
dust floating in the air to the
advent of health, but this may
duly be classed with the already
threatening subject of "An Atmosphere
laden with one chemical impurity,
in certain trades, occupations"
e.g. the organic dust or stuff
in the drills of which also we
hear here more than enough.
Many that much has been written
of such air impurities since the
time of the Italian Physicist Rea-
AZZINI—Who first directed attention
to the matter. The subject may with
much comfort to all concerned call
this paper, for lack of another further
discussion—