On Vital Statistics.

James Lushill.
On Vital Statistics.

Although Medicine as an art has for its object to prolong human life and to alleviate human suffering, yet as a science it embraces a much wider range than merely the elucidation of the principles that guide the selection and application of the means by which we seek to attain these results. It professes to explain the laws which preside over the primary evolution of the embryo and its separation from its parent; the complex system of organs and muscles, physiological and psychological, present in the adult human being; the
Professor E. Forbes, On the supposed analogy between the life of an individual and the duration of a species.

deviations from the normal structure and functions of organs, which constitute disease; the etiology or relation of causation which subsists between these changes and the type of health and different agencies at work either within the organism itself or in the physical and moral influences with which it is surrounded; and finally, which is the more especial object of this paper, to enquire into that principle of decay which is an inherent attribute of the human constitution, as of all organized bodies regarded as individuals, together with the influence on the duration of life exercised by those various agencies to whose operation man is subject.

This question will be discussed in the following chapters: I. On the rate of mortality, on the average duration of life, and on the expectancy of life in the two sexes at different ages. II. On the influence of profession, climate, &c., on the duration of life. III. On the mortality from...
On the Application of Statistics to questions in Medical Science, particularly as to the External Causes of Disease.

Part II. Ulcers.

Some curious and the circumstances under which they tend to shorten life, and partly on the application of such inquiries to useful purposes.

The numerical method of investigation (which, later, writing being extended to fields of enquiring where it was formerly considered as inadmissible, is most generally applicable to the solution of questions of this kind.) At the same time, while deduction are drawn from statistical comparison, we must, though in view the nature of the information thus obtained. This mode of enquiring, when applied to purposes of scientific research, can only estimate the frequency with which certain events are correlated or associated together. It cannot inform us as to the intimate nature of the agencies constituting the bond of union. For the investigation of such relations the numerical mode can only be used as an instrument.

Destinies. "Medical Logie"

Translated by the Royal Society.
intellectual processes of analogy and generalization, being required for the
mass of minute facts, thus accumulated can be framed into theories.

The first step in all statistical enquiries is the formation of standards of
comparison. Having obtained, for instance, the average rate of mortality
in an entire community, we are enabled by confining our observations to a
smaller section, to test the relative salubrity of different towns or districts of
country, and to estimate the relative mean amount of longevity enjoyed by the
members of different professions.

I.

The causes which influence the
duration of life are of a complex and
multiform nature. There is, as has been
already observed, a principle of decay
implanted in the human constitution
and which man possesses in common
with all animal and vegetable organs.
some. Further, the various physical influences with which he is surrounded may in a variety of ways, and in some circumstances be favorable and in others unfavorable to the prolongation of life. In addition, an intimate sympathy exists between the mind and the body, whatever tends to depress and harass the mental faculties, notably prejudicially through this channel to distinguish the animal function and diminish the chances of a long life.

What we name the law of mortality is therefore not the expression of a simply law, but of a complex system of operations, physiological, physical, and moral, and which, when the circumstances under which they operate are in any way altered, affect in a corresponding degree the rate of mortality, and further their differences in this respect which are observed in persons occupying different social positions, pursuing different occupations,
and in the children of parents who are of feeble or robust constitution. When the contingency of premature death is balanced against the probability of prolonging life, it has been found that certain mean periods may be determined upon, which shall represent the average duration of human life under different circumstances. Although nothing can be more uncertain than the periods of life which isolated individuals may be expected to enjoy; yet mankind, viewed in masses is found to possess certain common features which either remain the same or vary according to definite principles.

Man is not equally mortal at every period of his existence. In other words the “fundamentally to death” is not alike strong at all ages. When the transition past nutients to individual life has been accomplished, an important series of changes occur in several of the most important of the vital organs, and the body of the
Borthwood Smith: On Epidemics, p. 41.
Edinburgh 1857.

child is surrounded by a mass of new conditions and influences. A large proportion of the human race which while this process is being made of shortly after it has been affected. About 1/4th part of all the children born in England next year before completing the first year of life, and 1/2th never attain to their fifth year. This mortality enormous as it is it is yet favourable when compared with the infantile mortality in the beginning of the present century and at later periods. The same improvement has been observed in France. This beneficial change is to be ascribed to improvements in the sanitary art and to ameliorations in the social condition of the people which chiefly affect the female portion of the Community. The chance of attaining old age is much superior in females than in males. This has been ascribed to the comparative immunities which most females excluding those in the very lowest grades of society enjoy from the various causes
La durée moyenne de la vie pour
la France entière et pour les deux divisions
existantes.

<table>
<thead>
<tr>
<th>Hommes</th>
<th>Femmes</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 - 10</td>
<td>43 - 6</td>
</tr>
</tbody>
</table>

Pour la France entière
38 ans 4 mois

Pour les départements
Premier classe, Premier état 43 ans 6 mois
Second classe, dernier état 34 ans 11 mois 35 - 10

M. Charles Dupin - Sec. Ec. (marins).

Edinburgh 1855.
incidental to the male sex in the pursuit of the business of the world. Females and from, in the degree to which they are exposed to causes unfavourable to prolonged life, approximated to those of the male sex placed in a calmer or independent circumstances, in whom the highest rate of mortality occurs at a late period of life. Even in districts of country unfavourable to longevity, females live with a better maintenance of their superior to that of males inhabiting the same quarter. The high rate of mortality which occurs at the earlier periods of life falls with much greater force on males than on females. The difference in the infant mortality in the two sexes has been elaborately traced in its various relations by Dr. Simpson and the explanation of the apparent anomaly is accounted for by the slight excess of male in the mother of the male over that of the female by which the various morbific complications during and after childbirth are much enhanced in
reference both to the mother and the child.
At the age of 13 the amount of mortality is at a minimum; after this age life becomes progressively more unstable. Mr. D'Arcy has attempted to show that after viability or secureability has reached its maximum at 15, it does not proceed to the limits of life in a uniformly descending scale: but that, at about the commencement of adult life, the rate of mortality becomes much increased, and at the age of 25 has reached a temporary maximum. At 30 life is again nearly as stable as at 20. He finds that this circumstance does not hold good in regard to females; and attempts to ascribe this anomaly in the case of males to the injurious influence of the passion which attains their acme at that age. The effect of the same agencies in females, he says, is obscured by the increased mortality in that sex due to the process of child-bearing, which has begun several years earlier.
Mr.壶突's observations must have been made when a small deal or confined to a limited section of the community. Since, as we shall afterwards find, although these fluctuations in the scale of mortality are not obvious when applied to the entire mass of the population, yet when our observations are confined to particular professions, it is not uncommon to find 2 or even more periods at which particular influences incident to that class produce an increased number of deaths.

The "rate of mortality" may be viewed in two different aspects, either by comparing the number who die at any particular age with the proportion constituting the population at that age or by substituting a comparison between the number who enter upon life and who attain to that period of existence, the expectancy of life.
The 'probable age' (celui dans lequel) represents the probable age of the individual starting from any given point. It may be expected to attain.

The 'average duration of life' (durée moyenne) is found by adding together the sum of the years of life enjoyed by a large mass of persons, starting from a particular age, and dividing this sum by the number of individuals constituting the aggregate. The quotient thus obtained furnishes the data on which calculations of life assurance are founded, as we are thus provided with an opportunity of predicting the mean number of annual premiums which will be paid on a large number of policies.
Diagram indicating the incidence of disease (or something) over time.
Curve similar to the preceding constructed from data furnished in the Registrar General's Report.
II.

In Profession.

Statistical comparisons amply confirm a circumstance which is a matter of every-day experience, viz. that different professions are not equally favourable to longevity. This subject is an important element in all enquiries into "vital statistics," and has formed the theme of several independent works.

We can readily understand how workmen exposed to the inhalation of noxious fumes, or like the middle point of forestallers, constantly breathing an atmosphere loaded with particles of finely divided dust, should be execrably subject to diseases that induced, and in some parts of an early age. On the other hand, how the sons of learned leisure enjoyed by the clergyman of the Established Church in England should equally conducive to a favourable prolongation of life.
particularly the 11th and 15th Annual Reports.
In various other professions the influence of work can be a matter of complicated nature, and the amount of longevity among their members can only be estimated by investigating the mortality which occurs among such persons compared with the number engaged in these occupations, and more particularly by observing the periods of life at which the greatest rate of mortality is attained.

The results obtained by comparing the deaths occurring in particular professions, relatively to the number of persons engaged in them, often yield unsatisfactory results. On the whole, it is much more instructive to study the course of "curves of mortality" delinated according to the proportion of deaths which occur at particular ages.

The diagrams which follow, constructed upon data furnished by the Registrars, generally reports, illustrate these points better than any amount of verbal description could do.
"Curve of Mortality" for Males aged 20 and upwards, in England and Wales.

"Curve" for Persons of Rank and Property.
Clergymen & Ministers

Farmer
The plan on which the preceding diagrams are constructed, will be readily understood. The number in black at the top represent the ages. The figures to the interval of time under observation, 35-45 being the 10 years between 35 and 45. Add all the figures written in red at the bottom of each diagram, added together they would amount to 100. The red figures therefore express the proportion per cent. dying in each interval, which is also marked by the height to which the curve rises, as indicated by the figure in blue at the margin.

We are still in want of materials by which to ascertain the causes of death in different professions at particular ages. Otherwise we would have doubt that a very large proportion of the deaths which occur at an early period of manhood among sailors, seamen and commercial clerks was due to Pneumonia, Typhus, and other fever. This is the voluntary employment and confined atmosphere inseparable from these
occupations.

The beneficial influence resulting from a change in the habits of life, is
well illustrated in comparing the careers of men respectively in the commercial
clerk and the commercial traveller.

In these two classes of persons placed in the same social position, the high
distinction of active exercise in the
open air, has the effect of removing
the maximum rate of mortality to a
period from 10 to 20 years later in life.

The advanced ages, which have been attained by most celebrated scientific
and literary men, prove that a list of
Aryan is not necessarily hurtful to
health. We can however desire to overlook
the great number who are cut down
before reaching its culmune. The large
proportion of Radical men who die in
early manhood may perhaps more fairly be ascribed to the difficulties which
beset the attainment of a status in their profession, rather than to any
circumstances of a physical nature connected with it's patient.

ON CLIMATE.

The prevailing diseases in a variable and humid climate such as ours are affection of the respiratory organs. In hot countries the digestive organs are prone to disease, and in countries in which either extremes of temperature prevail, various diseases of the integumentary system are very common. In mountainous countries, a species of mental fatigue and enlargement of the thyroid gland are frequently seen. In many other matters connected with climate the limits of our paper do not permit us to enter.
The tables in the preceding chapter were intended to exhibit the rate of mortality as deduced from observations made on all the causes which influence the duration of life. It is now proposed to isolate some of these individual elements which make up that complex whole, and show to what extent these separately contribute to the general sum of the causes of death. When we reflect on the difficulty only encountered in forming correct opinions as to the nature of maladies which prove fatal, it cannot be expected that the returns of the Registrar General, drawn from such a variety of sources, and frequently furnished by individuals of questionable skill and diagnosis, should be relied upon as accurate; still, this objection is to a certain extent outweighed by the great number of cases reported, especially as comparisons...
This kind can only be considered an approximation to the absolute truth.

The following table shows the relative importance which each of the following diseases contributed to the Mortality Bills for the Year 1851.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total deaths in England</td>
<td>1,000</td>
</tr>
<tr>
<td>Smallpox</td>
<td>14.5%</td>
</tr>
<tr>
<td>Rheumatic Fever</td>
<td>44.0%</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>55.8%</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>13.2%</td>
</tr>
<tr>
<td>Cancer</td>
<td>24.9%</td>
</tr>
<tr>
<td>Dropsy</td>
<td>45.1%</td>
</tr>
<tr>
<td>Trachoma &amp; Syphilis</td>
<td>10%</td>
</tr>
</tbody>
</table>

As we have already seen, that much larger numbers of deaths occur at particular periods of life than at others. The same circumstance is also observed in studying the mortality from individual diseases, with this peculiarity, that the ages at which they most frequently occur, are not exactly identical in them all. The diagrams which follow are constructed on a plan similar to those relating to professions.
"Curve of Mortality" for deaths in London from all causes.
Aphelion

Eclipse

[Graphs showing data with labeled axes and values]
On glancing at the diagrams, the heavy rate of mortality which occurs during the first five years of life is at once apparent. It is also noticeable that while Hydrocephalus and Tuberous Sclerosis are almost exclusively restricted to childhood, consumption and Cancer are most frequent in adult life, while Bronchitis is most fatal at the two extremes of life.

Consumption, Hydrocephalus and Tuberous Sclerosis are but different forms of the common disease, and their occurrence at very different periods of life seems to be due to a physiological law which directs the histogenic agency to localize itself in the early infancy in the brain, in childhood in the medullary glands, and in adult life in the Parenchyma of the Lungs. Cancer which more particularly prevails in the prime of manhood seems to be but another form in which the aforementioned histogenic agency is directed.

Certain diseases and predispositions to particular morbid conditions are
Paris. 1856.
The transmission from parent to their children, maternal and paternal, is frequently one of the origin to constitutional idiosyncrasies inherited from one or both parents. It has been observed that similar peculiarities in the character of plantations have occurred in several members of the same family. In some diseases, such as certain rheumatism and jaundice as affections of the brain, heart, and kidneys, the circumstances in their etiology is still a matter of doubt. However, it is considered a matter of as much importance to enquire into the diseases which have occurred among the immediate relatives of those who propose to effect insurance on their lives. Accurate and comprehensive data are still needed in order to appreciate the value to be attached to the occurrence of rheumatisms and other diseases of a hereditary character among the members of a family.

The possession of a dominant type among certain pathological conditions...
Often presenting very different external features, in a circumstances already alluded to. A somewhat analogues principle in pathology, which modern observation tend rather to extend, is that certain morbid conditions are liable to generate certain others, and that these follow each other in a certain order of sequence. Among these, may be mentioned the supposed connection between the occurrence of nephritis and diminution of the activity of the kidneys. That by alteration of the heart, may follow some diabetic condition, of the kidneys. And as better ascertain, relations known to exist between Bright's disease of the kidneys, and parietal, and glomerular, as a precursor of the same, and other cardiac complication. For the investigation of these question it would be necessary to ascertain how often these diseases occur singly, and how often in combination. An interesting review of the heart cases which have occurred in St. George's Hospital London, has been drawn up by
Dr. Oscaray, in which the proportion of cardiac cases which possessed a rheumatic history, and the age at which this complication is liable to occur, can all be seen. The following table exhibits the results which he has arrived at. Among the things he gives, in regard to a limited number of the cases, the diseases which intervene between the prior attacks of acute rheumatism and the fatal event, circumstances which may contribute something towards a knowledge of the value of the lives of persons suffering from these diseases.

An interesting field of enquiry has been opened up in the reports published by Professor Christianon and Dr. Breglia, relating to the causes of death among the insured. The controversy instituted by Prof. Christianon between the periods of expectancy and the time of survivalship, actually accomplished, and peculiarly instructive at the results arrived at in this portion of the paper are exhibited in a tabular form on the following page.
<table>
<thead>
<tr>
<th>Name of Disease</th>
<th>No. Of Cases</th>
<th>Conjoint Expectation</th>
<th>Period Survived</th>
<th>&amp; Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidemic &amp; Infection</td>
<td>28</td>
<td>940</td>
<td>120</td>
<td>17.58</td>
</tr>
<tr>
<td>DI. of Brain &amp; Spine</td>
<td>34</td>
<td>944</td>
<td>304</td>
<td>32.20</td>
</tr>
<tr>
<td>DI. of Respiratory Organs</td>
<td>1</td>
<td>310</td>
<td>113</td>
<td>36.45</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>1</td>
<td>135</td>
<td>48</td>
<td>38.88</td>
</tr>
<tr>
<td>Bronchitis</td>
<td>1</td>
<td>260</td>
<td>125</td>
<td>48.07</td>
</tr>
<tr>
<td>DI. of Organ of Circulation</td>
<td>21</td>
<td>103</td>
<td>41</td>
<td>41.30</td>
</tr>
<tr>
<td>Heart &amp; Vein</td>
<td>2</td>
<td>46</td>
<td>14</td>
<td>31.81</td>
</tr>
<tr>
<td>Blood &amp; Vein</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DI. of Digestive Organs</td>
<td>11</td>
<td>191</td>
<td>71</td>
<td>37.1%</td>
</tr>
<tr>
<td>Liver</td>
<td>11</td>
<td>264</td>
<td>55</td>
<td>20.88</td>
</tr>
<tr>
<td>Duodenum</td>
<td>11</td>
<td>128</td>
<td>75</td>
<td>44.64</td>
</tr>
<tr>
<td>Stomach</td>
<td>42</td>
<td>105</td>
<td>15</td>
<td>14.28</td>
</tr>
<tr>
<td>DI. of Urinary Organs</td>
<td>42</td>
<td>34</td>
<td>18</td>
<td>50.00</td>
</tr>
<tr>
<td>Bladder</td>
<td>3</td>
<td>74</td>
<td>27</td>
<td>36.48</td>
</tr>
<tr>
<td>DI. of Urinary Organs</td>
<td>32</td>
<td>94</td>
<td>15</td>
<td>15.42</td>
</tr>
<tr>
<td>Cancer</td>
<td>9</td>
<td>242</td>
<td>50</td>
<td>20.66</td>
</tr>
<tr>
<td>Violent Death</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Total number of Heart Cases with a Rheumatic History: 2016.
Proportion & Cnt.: 69.

<table>
<thead>
<tr>
<th>Character</th>
<th>Male</th>
<th>Female</th>
<th>&amp; Cnt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rheumatic</td>
<td>34</td>
<td>28</td>
<td>62</td>
</tr>
<tr>
<td>Non-Rheumatic</td>
<td>41</td>
<td>32</td>
<td>73</td>
</tr>
<tr>
<td>Effectual</td>
<td>45</td>
<td>26</td>
<td>71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age on Admission</th>
<th>Fatal</th>
<th>Not Fatal</th>
<th>Fatal</th>
<th>Not Fatal</th>
<th>Fatal</th>
<th>Not Fatal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10 Years</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10-20 years</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>20-30 years</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>30-40 years</td>
<td>2</td>
<td>10</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>40-50 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Over 50 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Duration of first attack of acute Rheumatism from fatal event:

- Male:
  1. 2 deaths at 4 years
  2. 3 deaths at 6 years
  3. 1 death at 8 years
  4. 1 death at 23 years

- Female:
  1. 2 deaths at 12 years
  2. 1 death at 15 years
  3. 1 death at 16 years
too limited a field for the institution of a just comparison between the periods of expectancy and survival. They necessarily show only those lives which have fallen short of their mean period. Then after a proper number of years have passed, the analogous series of observations shall have been made, the results shown will be similar to those furnished by a commercial balance sheet.

The perfection which has been attained in modern times, in the diagnosis upon the living body, of many diseases, the means for the detection of which were formerly so very imperfect, has given to the Medical Officer considerable assistance in deference to the assurance the power of excluding such persons as are labouring under the manifestation of a morbid condition detrimental to the prolongation of life. While it is true quite just that lives below the average should be deducted from the benefits of assurance, at rates of premiums framed to apply only to
average lives, the privileges of life, assurance need not be entirely withheld. Examination which as yet have only been imperfectly made, as to the duration of maladies, and the distances between their first accession and their fatal termination, may yet furnish data by which we may be enabled (taking into account the gravity of the symptoms, the age of the patient, his occupation, mode of living &c.) to estimate with sufficient accuracy for practical purposes the probable duration of life.

The difficulties attending an investigation into the mean duration of life in particular diseased conditions, although great, are not insurmountable. The difficulties of every individual case would require to be carefully considered, and estimated in a favourable or unfavourable light, when others are compared with standards framed according to the gravity and duration of the complaint, the habits and mode of life of the patient, his profession,
"Disease of the Heart and S gu." p. 903.
And the mortality among persons in the same external circumstances.

It is well known to medical men, that many persons labouring under a disease of one or more of the valves of the heart, are yet, by exercising a certain amount of caution, enabled to engage in some sedentary business of the world. The same is also true of patients, an examination of whose lungs proves that they are in some degree the subject of tubercular deposit. Indubitably, many cases of sudden death occur in the subject of such lesions. But it is to admit, while admitting their danger also grants that even the most serious, are not incompatible with prolonged life. The arrangement of the several orifices of the heart are placed in the following descending series: in relation to their distance from the aorta, 'tricuspid regurgitation, mitral regurgitation, and coronary; aortic regurgitation and least of all aortic constriction.' The frequency with which the two first are connected with pulmonary complications,
"Αρείδη, νῦν ἀμέτακτη μπλάχα θετᾶς ὅιων

Αὐτοὶ ἀποστρατεύοντο, εἰ κὲν Ἰανατον γε φυγοίμεν.

"Εἴ δὴ όμοις Πόλεμος τῆς θαμώς καὶ λοίμως Ἀχαίων"

Ιλιαν. Εἰπ. Ι. σκ. 60, 61.
greatly enhance their importance.

Epidemic diseases, on account of the great number which fall before them, are of great interest in an inquiry into the laws of mortality over a prolonged period. It would be interesting to know if there is any law regulating the periodicity of these occurrences, and what are the average number who fall before them in the course of a certain or other long period. Fortunately, no statistics exist on this subject, except those relating to the last few years. The Report by the College of Physicians of London on the Annual Outbreak of Cholera, are a valuable contribution to this branch of inquiry.

Many accounts of epidemics exist in ancient history. Several are recorded in the sacred writings. Homer describes of a deadly plague which first attacked the hero Achilles and afterwards proved fatal to Men. Herodotus narr
Epidemic of the Middle Ages.
Translated by The Wellcome Society.

Paris, 1515.
eloquently described the fatal epidemics that prevailed in the Middle Ages, and the strange perversion of the mental faculties which at that time occurred, the thickening of the intellectual darkness which then brooded over the civilized world.

The fabulous writers of antiquity ended such occurrences as the prodigies of an offended deity, and others have endeavored to trace the connection between the outbreaks of such calamities, and the periods of certain natural prodigies, as the occurrence of earthquakes, the eruption of volcanoes, and the appearance of comets.

Conclusion.

The study of vital statistics, apart from the scientific interest attached to the questions thus elucidated, is not devoid of results capable of practical application. By directing attention to the conditions and circumstances under which different
A degree of mortality is produced, enquiry is warranted, and inquiry is stimulated to arrive means for the social amelioration of classes of the community placed in circumstances unfavourable to the healthy exercise of the bodily functions. It was not till a comparatively late period that the attention of philanthropy was directed to the establishment of a scheme by which the social evils which result from the premature deaths of the head of a household, or other individuals on whom others incapable of providing for their own wants, relieved for their subsistence. Life assurance societies may be said to have existed only within the last 50 years, and the mass of the community are still very little awakened to the important benefits they confer upon society, and the sound scientific basis for which the system is founded. Life assurance, as a science, involves truths out of calculations. One is based on the mean number of
annual payments which it is likely will be made to the Office. This is determined by finding the average duration of life of a certain age. The other element here to deal with is the interest of money, and involves a calculation into the compound interest constantly accumulating when the premiums are paid annu-ally. An insurance policy is accustomed to select only such persons as are in the enjoyment of good health at the time of contractation. If the health of premiums charged are framed accordingly to calculations made when the entire community, a considerable amount of gain will be realised. The dealers in insurance should admit of a limited degree of fluctuation, in order to individual cases. At the same time, there is no reason why diseased lives should be admitted to a participation in the benefits of this system. Of course, in these matters, the medical exami-
motions would occupy a much more prominent place than in an ordinary proposal, and would be greatly complicated by the varying nature of the elements on which the calculation would necessarily be founded.

James Uphill.