arsenic in the beer is small and it would require a consider-
able time to make a quantitative analysis; about the presence
of arsenic in appreciable quantity there can be no doubt."

From these results it is evident that arsenic is contained
in the beer in sufficient quantities to account for chronic
arsenical poisoning. The symptoms of the cases inquired
into are also quite consistent with this view—viz.,
running of the eyes and the nose, pigmentation of the
skin, various rashes, including peeling of the bands
in the hands and feet, and diarrhoea (in one case).

- Other cases have been heard of where the individual
has suffered from vomiting and diarrhoea and has at
once ceased drinking the offending beer, no further sym-
ptoms occurring. Further, every case we have followed up
in other districts.

1 Beer. \( \alpha \) 2
2 Hops. \( \beta \) 3
3 Glucose. \( \gamma \) 4
4 Inverted sugar. \( \delta \) 5
5 Malt. \( \varepsilon \) 6
6 Various other beers.
7 Firm A. 7
8 Firm B. 8
9 Firm C. 9
10 Preservative. 10
11 Gypsum. 11
12 Water. 12
13 Glucose. 13
14 Inverted sugar. 14
15 Sulphate of arsenious acid. 15
16 Sulphuric acid. 16
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We cannot conclude without referring to the very great
assistance which we have received from Dr. Coutts, F.I.C.,
who has carried out the great bulk of the analyses. In
conclusion, we think we have proved the correctness of Dr.
Reynolds's opinion that this outbreak of disease is due to
arsenical poisoning from beer-drinking; that the presence
of arsenic in the beer is due to the use of contaminated
glucose and inverted sugar by the brewers; that this
contamination of sugar is caused by the use of very impure
sulphuric acid and very impure sugar manufactured prepared
from arsenical pyrites. It seems to us very necessary that the use
of sulphuric acid in the preparation of articles for con-
sumption should be placed under strict supervision.

Salford, Nov. 27th, 1900.

C. H. TATTERSALL.

**8** We have received photographs of the octahedral
crystals of arsenic acid obtained from 40 cubic centimetres
of the specimen of beer marked by in the table, and from three
grammes of the specimen of glucose marked 44.—Ed. L.
mosquitoes which might accidentally penetrate into the
houses, I decided to refer to the experiment which I made in the resitivo-autumnal season of
1899 on the two railway lines, notoriously malarious, of
Prenestina-Cervara and of Pontegalera. I shall therefore
give a brief résumé of the official report dated Dec. 13th of last
year.1 On the first-mentioned of these two lines we
covered the windows with frames of tulle,2 thus allowing
air and light, but no mosquitoes to pass. At the top of the
stairsc a door with a similar frame was placed the better to
protect the bedrooms. This door, as well as the outer ones, was made to close automatically so as to
exclude all human warmth. The entrance door, as being
more liable to injury, was furnished with wire
gauez instead of muslin. We advised the inmates to sleep
with the windows open so that the air, filtered as it were
from insects, might pass in freely. For the protection of
persons employed on night duty we used gloves like those of
bees-keepers, provided with a circular mask of wire gauze and
having attached to it below a veil tucked under the coat, at
the ends of the sleeves of which very wide gloves of chamois
skin were tightly sewn on. A vigilant outlook was daily kept
for mosquitoes in order to find and eventually to capture
them in the houses. Every family was provided with a
powder for burning in case by any chance a mosquito should make
its way in. The neighboring linemen's cottages of the
stations of Cervara and Pontegalera served as controls. On
the Preneista-Cervara line Cottage No. 6 served the same
purpose, the inmates being negligent and refractory and
allowing mosquitoes to enter constantly. Some of the latter
were caught in the act of passing through a wire-gauze
which last year served us as controls. We were able, how-
soever, to show by a comparison of the results obtained in the
control zone of Pontegalera, and in the cottage
in which the epidemic which afterwards developed attacked 12 out of
the 14 inhabitants. Among the controls on the Cervara
line 24 persons contracted malaria and at the station of
Cervara, renowned for its malaria, all were attacked.
In the control zone of Pontegalera, two persons
who had acquired immunity from having had the disease
previously escaped infection. On the other hand, in the
line's cottages which were protected, out of 24 persons four
were attacked, the watchmen and the one housekeeper who
had been placed in front of the door so as to form a kind of
porch or ante-chamber. This addition of a porch, first suggested by
Dr. Blessich, is very useful in giving greater protection to the
rooms on the ground floor and affording a shelter where in
the summer the family can have the benefit of the open
air without actually going outside. As a rule, the doors
were made to close automatically, and to make sure that no
mosquitoes were discovered by a wider mesh. To render easier
the discovery and destruction of any mosquitoes that might
have the chance to enter, the walls of the rooms were whitewashed.
Large and repeated doses of quinine had been administered to
any persons who had relapses in the spring as well as in the
autumn, at the commencement of the prophylactic treatment of those
who were attacked, but these were on night duty and took no heed
of our instructions. Three of them were ill for a long time,
two from tertian, spring and autumn varieties respectively,
and one from quartan fever. In spite of quinine administrated
promptly and abundantly they relapsed several times and
their blood contained a large number of gametes—that is to
say, of those parasitic forms most dangerous for contagion.
At the same time their wives and children living in the
protected houses along with them enjoyed immunity from the
disease. The difference that wire-gauze10 was everywhere substituted
for the muslin, and that a large cage of wire-gauze was,
attached to it below a veil tucked under the coat, at
the ends of the sleeves of which very wide gloves of chamois
skin were tightly sewn on...
everyone had had fever it sufficed to extend to it the new prophylaxis.

I have described on the second to the twentieth kilometre inclusive. On this line the experiment succeeded in a degree highly convincing. Here there are two types of lineman's cottage—the new and the old; the latter from its peculiar construction, is less exposed to the invading mosquitoes, and we left to serve the purpose of control. This turned out to be a fortunate circumstance because the old and the new cottages as nearly as possible alternate with one another. Now in the protected houses out of 57 inhabitants not one had fever; even from the unprotected houses out of 51 inhabitants only seven escaped, and these were nearly all adults, immune in consequence of previous attacks. Among the children, on the other hand, only two out of 29 escaped infection. In the protected cottages Nos. 15 to 19 inclusive, out of 42 persons only two were attacked. We also made two further control experiments. On August 23rd it became necessary, for reasons connected with the railway service, to transfer a family consisting of a husband, wife, and son from cottage No. 17, where they had always enjoyed good health, to the next cottage, No. 16. About a month afterwards the wife and child were attacked by fever. On the other hand, a family consisting of husband, wife, and five children of the same family, who had been placed in cottage No. 17. We at once put them upon a full and prolonged course of quinine followed by tonic treatment with arsenic and iron. Secure in their protection, the wife and the child offshoots of the mosquito, the family enjoyed an excellent recovery, although their convalescence and cure had to go on through the height of the malarial season. Only one of the children, in whom the relapses were more obstinate, still remains in somewhat poor condition. On this Castelgiubileo line the proof of the value of the new prophylaxis has been most decisive and eloquent. Of a whole community of persons all subjected to the same conditions in other respects, those whom we defended against mosquito invasion have been free from malarial fever; whilst those without protection have nearly all been attacked. It is as if we had a book with its pages alternately white and black, the white pages corresponding to our protected cottages and families, the black representing those left unprotected. No less decisive in their results were the experiments made on the other lines.

3. Pontegalera line. Here, in the section outside of the protected zone, in cottages Nos. 15 to 19 inclusive, out of 42 railway servants only three escaped the fever. In our protected zone, on the other hand, out of 36 persons only two contracted it, while in the section further on, from the twenty-seventh to the thirty-third kilometre, out of 10 persons only one remained unattacked. Even when we had the station of Pontegalera, placed almost in the midst of our zone of experiment, where out of seven persons six were attacked; the first lineman's cottage on the Fiumicino railway, where all of the three inmates suffered; and the hamlet enclosed in a straw hut, closing thoroughly with straw all the holes of tavern, which I also protected with the netting. And, finally, I determined to make the same experiment with that most primitive of all human habitations, the straw hut, closing thoroughly with straw all the holes in its sides, and with wire gauze the openings for allowing the smoke to escape; I placed at its entrance a big cage of treatment. None of the others had malaria. On this line also I was able to establish a series of controls analogous to those I have described on the Castelgiubileo line, in which here and there cottages unprotected. Of 37 persons inhabiting these latter 35 took fever.

To sum up, of 207 railway employees subjected to the new prophylaxis against malaria during the season 1899 and 1900 only 10 contracted fever, although they were living in the most unhealthy regions of Latium and in the midst of their fellows, all, or nearly all, of whom were stricken by the disease. Also, in houses defended against the invasion of mosquitoes malaria can be carried on in malaria-infected localities in houses protected from the invasion of mosquitoes quite as well as in places which are actually unhealthy.

It is to be noted, in conclusion, that this favourable result was obtained with the utmost simplicity, all that was necessary being a little persuasion with a small present, and the supervision which I adduced to this railway official who assisted me, one on the Adriatic and the other on the Mediterranean railways, were able to exercise. A similar result could therefore be attained wherever and whenever desired, and I am able to say that these two railway companies propose to secure it on the largest possible scale.

B.—PROTECTION OF THE CARETAKERS IN THE CAMPAGNA.

Two Roman companies—namely, the Società del' Acqua e Luce—have made several attempts to shut up a caretaker's house on the road from Rome to Tivoli, both situated in localities with a bad type of malaria which has hitherto attacked the families residing in them every year; or rather, I should say, the wives and the five children, for the husbands, owing to many years of suffering from the disease, have become immune. This year for the first time the wives and children have escaped infection, and this immunity they owe to my having had their houses protected before the beginning of the season. I committed to the care of these latter 35 took fever.

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of these latter 35 took fever.

1605 THE NEW PROPHYLAXIS AGAINST MALARIA: EXPERIMENTS IN LATIUM. [DEC. 1, 1900. 1605
believe that malaria may be conveyed by the bites of mosquitoses at the Cervelletta and one at the Castella.

to close automatically. I protected three huts in this way, the same material, furnished in its turn with two doors made
the fact. Oa thii account I met with much less difficulty
had expected in getting them to carry out the new prophylaxis
infection, notwithstanding that some stagnant water from a
as to insure success.

of malaria even in the most primitive of dwellings, the straw
the disease in former years had no fresh cases in it. One
the previous year's epidemic. And the house so cursed with

ditch, which was brought into the house in an old cask,
which can be taken to pieces and transported to wherever it

interest in the area of malaria and other diseases.

THE METROPOLITAN BOROUGH COUNCILS.

The following list, compiled from official information, is
a substantially complete enumeration of the medical men
who have been elected members of the first metropolitan
borough councils. There are, however, we believe, one or
two vacancies to fill in consequence of the election of
aldermen from the council, but the filling of these vacancies
will probably leave the list unaltered.

Battersea.—Councillor: Mr. L. S. MacManus, M.D., M.Ch.
I. R. I. Bermondsey.—Councillor: Mr. J. Muequeen, L.R.C.P.,
L.R.C.S. Irel.
Bethnal Green.—Councillors: Mr. W. A. Farbrother, L.R.C.P.,
L.R.C.S. Irel., and Mr. F. E. Rogers, M.R.C.S. Eng., L.R.C.P.
Lond.
Camberwell.—Councillor: Mr. A. Smith, L.R.C.P. Irel.
Chelsea.—Councillor: Mr. J. W. Erskine, B.A., M.B.
T. C. D., L.R.C.S. Irel.
Deptford.—Councillor: Mr. F. T. Tyler, B.A., M.B,
L.R.C.P. Lond., M.R.C.S. Eng.
Finbury.—Councillor: Mr. E. Jones, M.R.C.S. Eng.,
L.R.C.P. Lond. (Chairman of the Public Health Committee).
Fulham.—Councillor: Mr. T. C. Cooney, L.R.C.P. Edin.,
Greenwich.—Mayor: Surgeon-Lieutenant-Colonel R.
Googling, V.D., M.D. Lond., M.R.C.S. Eng., J.P.
Hackney.—Aldermen: Mr. F. H. Daly, M.D. R.U.I.,
L.R.C.P. Lond., and Mr. C. T. Hoakin, L.R.C.P. Lond.,
M.R.C.S. Eng., J. P. Councillors: Mr. J. O. Adams, M.D.
Durham, F.R.C.S. Eng., Mr. F. M. Miller, M.R.C.S. Eng.,
L.R.C.P. Lond., Mr. F. Wallace, L.R.C.P. Lond., M.R.C.S.
Eng., and Mr. M. E. A. Wallis, L.R.C.P. Lond., M.R.C.S.
Eng.
Hammersmith.—Councillors: Mr. O. C. Coker, L.R.C.P.
Lond., L.S.A., and Mr. W. A. Davidson, L.S.A.
Hampstead.—Councillor: Mr. E. C. Andrews, M.D.
Lond., M.R.C.S. Eng., Mr. C. W. Cunningham, M.R.C.S.
Eng., Mr. A. O. Grosevar, M.D. Edin., M.R.C.S. Eng.,
and Mr. F. E. Scrase, F.R.C.S. Eng.
Holborn.—Councillor: Mr. W. R. Smith, M.B. Aberg.
F.R.S Edin.
Islington.—Councillor: Mr. John Walker Smyth, L.R.C.P.,
L.R.C.S. Edin.
Kensington.—Councillor: Mr. F. H. Alderson, M.D. Durh.,
M.R.C.S. Eng., L.R.C.P. Lond., and Mr. E. D. Vinrace,
M.R.C.S. Eng.
Lewisham.—Alderman: Mr. J. W. Elliott, M.R.C.S. Eng.,
(retired). Councillors: Mr F J. L. Hart, M.B., C.M. Edin.,
Mr. F. S. Smyth, F.R.C.S. Eng., L.R.C.P. Edin., and Mr. H.
Visger, M.R.C.S. Eng., L.S.A.
Newington.—Councillors: Mr. L. A. Bidwell, F.R.C.S.
Eng., and Mr. J. Edmunds, M.D. St. And., M.R.C.S. Lond.,
M.R.C.S. Eng.
Paddington.—Councillors: Mr. J. J. Atkinson, L.S.A., Ur.
B. F. Popham, M.D. St. And., L.R.C.S. Irel., L.S.A.
Mr. A. Prince, L.R.C.P. Edin., M.R.C.S. Eng., and Mr. D. A.
St. Pancras.—Alderman: Mr. W. Smith. M.R.C.P.
Edin. Councillors: Mr. J. A. Angus, Mr. W. F. Hazel,
L.R.C.S. Eng., L.S.A., Mr. R. P. Long, L.F.P.S. Glasg.,
L.S.A., Mr. E. F. T. MacCarthy, L.R.C.P., L.R.C.S. Ire1.,
Mr. R. Paramore, M.D. Brux., M.R.C.S. Eng., and Mr. J.
Thompson, M.D. St. And., M.R.C.S. Eng., L.R.C.P. Edin.
Stoke Newington.—Councillor: Mr. J. Davies, M.D. Durh.,
M.R.C.S. Eng., L.S.A.
Southwark.—Alderman: Mr. W. G. Bott, L.R.C.P. Edin.,
M.R.C.S. Eng. Councillor: Mr. E. C. Perry, M.A., M.D.
Stoke Newington.—Councillor: Mr. R. Othler, M.B., C.M.
Aberg.
Wandsworth.—Alderman: Mr. T. A. Ives Howell, L.R.C.P.
Lond., M.R.C.S. Eng. Councillors: Mr. J. Gay, L.R.C.P.
L.R.C.P. Lond., and Mr. Mark Robinson, M.R.C.S. Eng.,
L.R.C.P. Lond.
Westminster.—Councillor: Mr. H. A. Des Veuz, M.D.
Woolwich.—Councillor: Mr. J. Jeken, M.R.C.S. Eng.,
L.S.A.