

GERMS—Arch Enemy of Mankind.



TOYING WITH DEATH.
AN EXPERIMENTER AT
THE INSTITUTE WATCHES
DEADLY GERMS WIGGLE
UNDER THE MICROSCOPE.

By "REX"

What is mankind's greatest enemy?
Not poverty. Not crime. Not war. It is
something much more ruthless and a thousand
times more malignant than all these three
scourges combined. It cannot be seen with the
naked eye, yet it is the cause of 36 per cent of
all deaths.

It is the infectious germ.

The infinitesimal parasite that breeds at a
tremendous rate, invades the human body and
makes nerve-shattered wrecks of strong men.
The terrible little creature which destroys lives,
ruins homes and wipes out nations.

"You can take a germ," a London physician
told the writer, "and under proper conditions it
would reproduce itself so many times in five days
that the size of the mass of germs it propagates
would exceed the size of this whole earth."

"This is a horrifying thought, but it is the
thought which the French people probably had
when they voted Pasteur the greatest of all their
national heroes, taking precedence over Napo-
leon, Victor Hugo and Danton. Pasteur, the
greatest scientist the world has known, was a
pioneer exterminator of germs.

KILLING GERMS IS THEIR WORK.

Exterminating and controlling germs is the
function of public health doctors, nurses and in-
stitutions. If there were no germs there would
be no need for public health. That is why public
health is the most vital municipal activity in
every and any community.

This is the point of view which Dr. H. W.
Hill, dean of the Institute of Public Health, has
been trying to inculcate into the civic con-
science of 172 municipalities. For twelve years
he and his associates have fought the battle
against disease and ignorance. On his side the
cold, unromantic facts of science and public
health are aligned against skepticism, prejudice
and intolerance—the three most tenacious oppo-
nents of public welfare.

Gradually, however, these obstacles have
fallen before the march of progress. What are
the results? Well, for one thing the death rate
from tuberculosis in London is lower than that
of any other Canadian city. Other maladies have
been substantially reduced. But the great, out-
standing achievement is that people have begun
to appreciate this fact—that every infectious
disease, whether it be as rare as leprosy or as
common as measles, is, with public health facili-
ties at our very door, as unnecessary as it is
inexpensable.

Gradually public health propaganda is break-
ing down the fortifications of indifference which
envelops the so-called intelligent, modern citizen.
People are being awakened to the anomaly of
knowing all about the mechanism of a motor car
without knowing anything about the mechanism
of their own bodies.

The mysteries of elementary physiology, of
medicine, of health, are no longer mysteries—or,
should not be. Health articles, explaining all
that curious citizen wants to know, may be had
for the asking. Yet the majority of people are
still more concerned with the action of their
flivver than they are with the action of their
liver. They can tell you when the differential
gears go wrong, but they can't tell you when the
kidney goes wrong, until, sometimes, it is too
late.

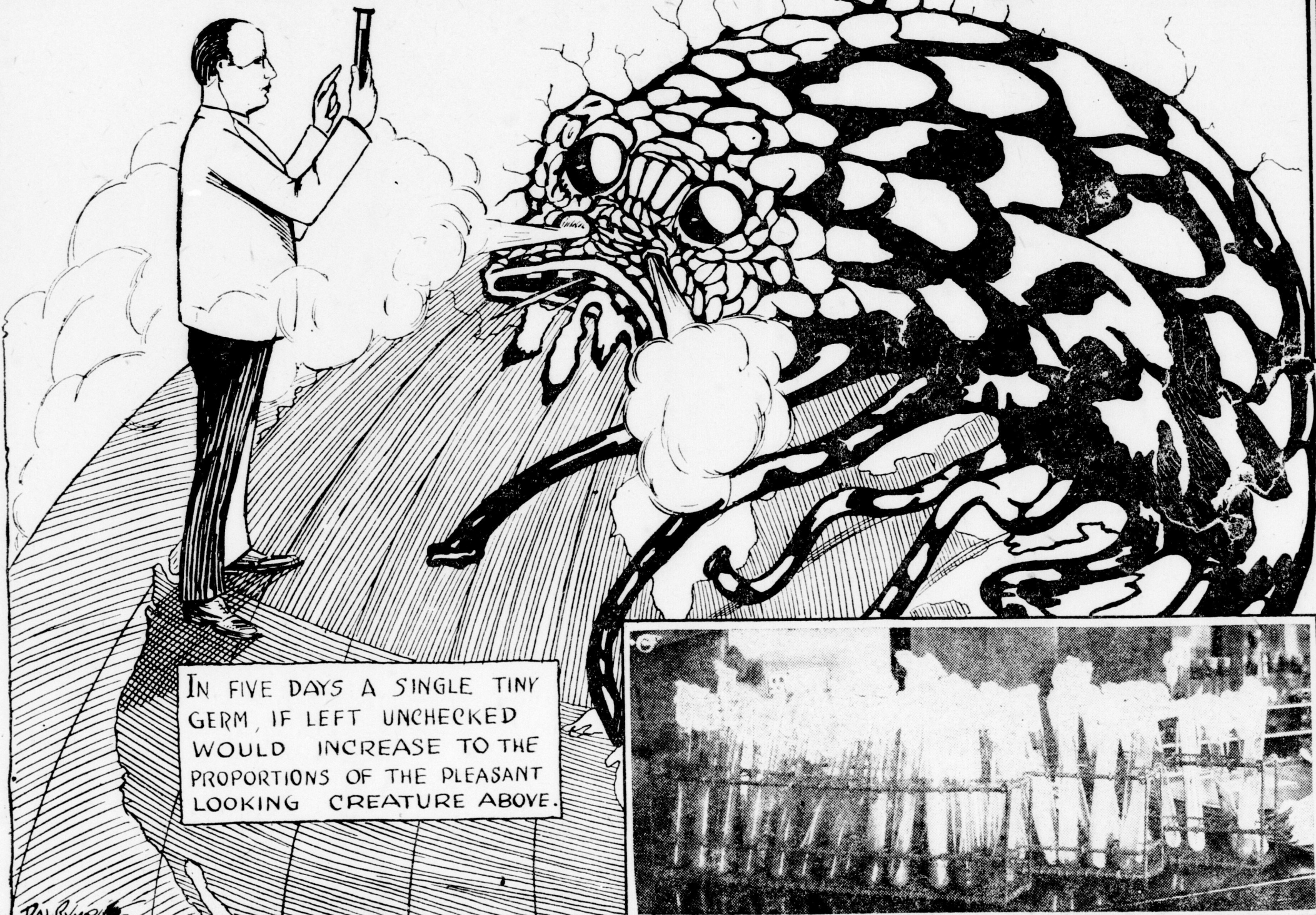
INSTITUTE SERVES 172 MUNICIPALITIES.

Serving 172 municipalities, the Institute of
Public Health is not only headquarters for the
distribution of propaganda which has done so
much to overcome this condition of indifference
to the welfare of one's own body. It is also a
great analytical clearing house in which drama,
sense and profound, is silently being enacted each
day.

Here chemists and analysts daily render their
verdicts of life and death. Here, throughout the
year, thousands of blood tests, throat cultures
and other examinations are made. Often, as a
result of these analyses, men and women are
subjected to treatment and regain health and
vigor. Often, too, these tests constitute the final
court of appeal, and the verdict is frequently—
death.

Yet scientific and statistical data in the pos-
session of the Institute indicate that 90 per cent
of such deaths are preventable. Ninety per cent,
in other words, are the direct result of neglect
and the parent of neglect, ignorance.

London's Institute of Public Health is an
organization of manifold activities. Health head-
quarters for 172 towns and cities, it is also one
of the most important pedagogic institutions in
Western Ontario, producing public health post-
graduate doctors and nurses each year and teach-
ing medical and art students the intricacies of
scientific dieting, chemistry, bacteriology and
kindred subjects. It also functions as a great
laboratory for industrial and organic chemical
research. Specimens of alcohol, milk, water,
foods of all descriptions and substances of every



IN FIVE DAYS A SINGLE TINY
GERM, IF LEFT UNCHECKED
WOULD INCREASE TO THE
PROPORTIONS OF THE PLEASANT
LOOKING CREATURE ABOVE.

REFRIGERATOR FOR ANTI-TOXINS.

First there are the departments occupied by
the Child Welfare Society, the Victorian Order
of Nurses and those who attend to the clerical
work of the institute. In the latter room stands
a refrigerator containing anti-toxins of all kinds
anti-toxins or vaccines for tetanus (lockjaw),
smallpox, whooping-cough, typhoid, and diphe-
theria. These are distributed to physicians daily.
In this connection it is significant that more than
20,000 tubes of vaccine have been given to doctors
of Western Ontario by the institute since the first
of the year.

In another room special cooking is carried
out to prepare food for germs kept by the in-
stitute. Germs, by the way, are voracious, squirmy
things and their appetite is something to wonder
at.

"It requires 500 pounds of meat a year to
feed them," Dr. Hill explains.

In the next room you find the cultures (germs
from human beings) going full blast, if anything
so apparently still, yet so insidious, so deadly
as cultures in which disease-bacilli are repro-
ducing, may be said to go full blast.

On the shelves you see an innocent-looking
array of little test-tubes, each plugged with a bit
of white batting, each containing about a table-
spoonful of jelly-like substance in the bottom.

Dr. Hill lifts one out of the rack.

"These tubes contain the cultures in which
living disease germs are working," he says.
"This one, for instance, contains cholera spirilla."

You look at it, fascinated by the horror of
it, but he goes on taking out test-tube after
test-tube.

"This one contains tuberculosis germs, this
one anthrax, this one typhoid, this pneumonia,
and this—leprosy."

Yes, literally, bottled death. Someone put
these first germs, that have multiplied so, in that
culture, someone must take them out, someone
must experiment with them. And so you catch
a flash of the work that these men, and
such as these, are doing the world over. Quietly
they carry on their investigations, buried in their
laboratories, and perhaps you seldom hear of
them. But when you do, you are glad that they
have left the old days behind—the savage old
days that glorified an Alexander, a Hannibal, or
a Napoleon—and that we are arriving at those
which consider it more glorious to save life than
to kill.

WORKING WITH BOTTLED DEATH.

Working with bottled death for the saving
of human life! Yet an everyday bit of routine
for men such as these.

Out again into a smaller apartment you see
a no less imposing group of cultures. A young
woman is bending over a desk, heating an in-
strument, and before her lie bits of glass covered
with a red substance that looks like cochineal
dye. It is sputum covered with a material that
colors tuberculosis germs red. Each of these
bits of glass is labeled and beside them you see
slips of paper containing such stories as:

"Sputum"

"Throat culture—Dr. A."

And so on, sadly suggestive stories that tell
of anxious fears and scarcely less fearful waiting.

If you are curious, you will want to see just
what these microbes look like, and Dr. Hill will
sit you down to a microscope to get an intimate
glimpse of these deadly little creatures. If it is

tuberculosis sputum you will observe in-
finitesimal germs, lying like sticks of red
wood in the sample. If it is typhoid you
will see millions upon millions of germs,
all darting here and there and very much
alive, looking like tiny white sausages
congregated in an immense area. Yet the
actual size of the sample in which these
countless bacteria live is, to the naked eye, hardly
discernible.

"They are magnified about 150,000 times,"
Dr. Hill says.

Small as they are, however, these germs are
subjected to a sort of poetic justice for their
invasion of the human body. They, too, may be
attacked by parasites infinitely smaller than
themselves, and these parasites may be attacked
by other parasites, and so on, ad infinitum.

"In Johns Hopkins Hospital a tuberculosis
patient excreted 24,000,000,000 tuberculosis germs
every day," Dr. Hill explains in answer to a
question. "But this is extraordinary. The average
for such cases is only about 6,000,000,000
germs."

The next department visited is occupied by
doctors and nurses testing and experimenting
with cultures and parts of organisms. Many blood
tests for syphilis are conducted here each day.
A special germ-producing oven is maintained
which breeds all varieties of bacteria. The in-
stitute received a leprosy culture 12 years ago from
the United States, and the germs have been
reproduced and reproduced as one generation is
about to die off to be succeeded by another.

"In three days," Dr. Hill observes, "a single
germ can reproduce itself to such an extent that
it would fill up all the oceans after the water had
been drained out. Before this can happen, how-
ever, they die from their own excreta."

HOW GERMS ARE EXAMINED.

For years, scientists, in watching germs re-
produce themselves through the microscope, were
confronted with a baffling problem. They did not
know how to keep the germs still during the pro-
cess of reproduction. Finally, Dr. Hill invented
a very simple system which is now used univer-
sally. He placed the culture on a sticky substance,
so the germs could not move. Thus, scientists
could see plainly the reproducing process. This
is particularly interesting. Typhoid germs, for
instance, like all unicellular bacteria, breed sim-
ply by dividing into two halves, which immedi-
ately take on the aspect of an individual bac-
terium. First the germ grows larger. As its size
increases a line is seen to appear right in the
center. The microbe finally separates itself and
two microbes exist where one did before.

An adjoining department contains an array
of stills for distilling water, and here you are told
something of the process of analyzing water to
determine its purity. In yet another are thou-
sands of cards which have been sent out to
mothers and filled in by them, in the course of an
investigation into the diseases of children.

"Do children really have to have measles and
whooping-cough?" someone asks, and the doctor
smiles.

"Emphatically, no," he replies. "The day will
come when it will be considered just as dis-
graceful for a child to have measles or whooping-
cough as it is now to have vermin in the head."

Disgraceful, you see, because so avoidable. If
public and domestic conditions are as they should
be. Carelessness in regard to disease germs will,
in that day, be looked upon with as much disap-
proval as is today carelessness in regard to cock-
roaches.

"MENAGERIE" FOR TESTING.

Finally you come to the "menagerie," filled
with boxes of guinea-pigs and rabbits, some of
which bear markings of red or blue to show that
they have been inoculated with the germs of vari-

ous diseases. Guinea-pigs, you are told, are
especially susceptible to tuberculosis, their ino-
culations being, indeed, the finest test of that
disease.

Here, too, were you to visit this department
today, you would see rabbits, quivering, hyster-
ical creatures, who, because of their extraordi-
nary susceptibility, must pay the penalty of death for
the advancement of science and the happiness of
mankind.

All these departments of which the visitor
gets a bird's-eye view are really one department.
There are many others that cannot be more than
mentioned here, yet the scope of their work and
the extraordinary results accruing from it could
be adequately explained only in a large book.
There is, for instance, the laboratory under the
supervision of Dr. Albert Slack, in which thou-
sands of analyses are made each year.

Again, there is the section devoted to dis-
tribution of insulin for indigent diabetics, and
finally there is a room where students study
bacteriology. On the walls are large food charts,
showing the value of protein, salt and starch con-
tent of staple edibles. Some facts revealed by
these charts are, to the layman, nothing less
than astonishing.

One of the things they show, for instance, is
that beefsteak is about 60 per cent water. An-
other, that the amount of protein in fish is vir-
tually the same as that in meat—which illus-
trates the fallacy of persons "giving up meat"
and substituting fish under the illusion that the
protein content in the latter is much smaller and
consequently less harmful for certain organic
conditions.

TWELVE POUNDS OF CELERY FOR A MEAL.

"To get a square meal from celery you would
have to eat almost twelve pounds," Dr. Hill ob-
serves. "Celery is more than 90 per cent water."

In addition to being health headquarters for
14 counties, one of the institute's most important
functions is as an educational center, which
seeks to teach more than a million human beings
the gospel of disease prevention. Pamphlets
covering every phase of public health may be
procured gratuitously from the institute's library,
for it is only by saturating the public with health
doctrine and propaganda that premature death
and unnecessary disease can be abolished.

Immunity from and evasion of infection are
two vital elements in the educational and practical
work of the institute. To deal even superficially
with these prime factors would require more
ample space than is allotted in this article. But
it is interesting and eminently desirable for people
to become acquainted with some of the basic
rules. Here are a few of them from Dr. Hill:

"Whenever you have fever go to bed, it is
estimated that failure of people to carry out
this simple rule costs Canadians \$30,000,000 an-
nually, besides all kinds of sickness, sorrow, loss
of time, wages and death.

"Never try to fight off a fever. And when
you go to bed be sure you isolate yourself and
call a doctor.

"Undergo a thorough physical examination
at least once a year and preferably every six
months. A short time ago a man boasted to me
that he had not been to a doctor since he was
insured 14 years ago. If he had gone to a doctor
he would have been alive today because he would

have received treatment for an insidious organic
disease which he did not know he had. When
pain and swelling assailed him he visited a
medical man, but it was then too late.

"Have all superfluous growths, tumors, wens,
cysts, warts, etc., removed. Frequently inno-
cent-looking growths develop into fatal cancers.

"Get rid of goitre before you grow up by
taking a little iodine salt from time to time.
Make your children take it and they will never
develop this widespread disease.

"Be up to date. Don't object to vaccination
or anti-toxins. If they were not beneficial they
would not be used. Fifty per cent of people
who refuse to take anti-toxin for diphtheria die.
If it is taken as soon as diphtheritic infection
is diagnosed the possibility of death is very
remote.

"We have discovered about proteins not only
that animal proteins (from meat, eggs, milk,
fish, etc.) are better than vegetable proteins for
building up bodies, particularly children's bodies,
but also that the best of all animal proteins for
building up infants' bodies are human proteins.
Young babies should eat human proteins only;
they should literally be young cannibals if they
are to be successful in after-life. No human
baby should be anything else than a cannibal the
first nine months of his life. That is the length
of time he should have human milk, not cow's
milk if it can possibly be avoided. The penalty
we pay for using cow's milk instead of human
milk for babies is the death of four to five cow-
fed babies for every one of human-fed babies.

THE NEED FOR VITAMINES.

"Refined foods and many carefully preserved
foods are apt to lack vitamins—a substance we
cannot do without any more than a fisherman
can do without hooks. A fisherman may starve
on the banks of a stream which is full of fish if
he has nothing with which to catch the fish. So
no amount of protein, fat, starch, sugar, etc.,
circulating in your blood stream will nourish you
unless vitamins are present. While there are
vitamins in many of our foods, leafy vegetables,
like lettuce, celery, spinach, etc., are good, and
lemon juice, orange juice and tomatoes. These
are best when eaten raw.

"Only abolition of infection can rid the world
of disease. Unless we rid ourselves, as a race,
of infection we must continue to pay the price
of human intercourse, meetings, parties, teas,
dances, church, etc., in heavy tolls of sickness
and death. Handshaking alone in Canada costs
at least \$3,000,000 annually merely in loss by
sickness transmitted by handclaps.

"The advantages of ventilation as an aid to
health have been grossly exaggerated. Most of
us die from germs and the invasion of germs on
body tissues. We contract the majority of
diseases from our fellows and from pollution of
the things we eat and drink."

Two important departments which have
proven of inestimable value to this city are the
Child Welfare Society and the Victorian Order
of Nurses. Offices of both organizations are in
the public health building.

The accomplishments of the Child Welfare
over a period of six years in London have now
become historic. When the society was founded
infant mortality here was more than double what
it is now.

The Child Welfare nurses, since 1916, have



DR. H.W. HILL
DEAN OF LONDON'S
INSTITUTE OF
PUBLIC HEALTH



Dr. Hill—Now what would
you like to-day??
We have everything
on the shelf from
Diphtheria to Leprosy!
TRY OUR FLAGELLA SUNDAY!

HELP FOR LONDON'S MOTHERS.

Every mother in London, rich or poor, can
receive advice and help from Child Welfare
nurses. No fee is charged, the expenses of the
organization being met by the United Welfare
Fund.

But while the Child Welfare Society serves
the mother and baby who cannot afford help,
the Victorian Order of Nurses carries on its
activities in all directions among the poor. Those
who can pay are expected to do so in full or in
part, but for those who cannot pay the services
and knowledge of a graduate can be secured
from the Victorian Order. These nurses visit
the poorer homes of the city, make beds, bath
babies and put everything in order for the bed-
ridden or convalescent mother.

The educational value of such work may be
better comprehended when it is considered that
not many years ago uninformed and frequently
misinformed mothers had no alternative than to
apply their own meagre knowledge and experience
to the problem of rearing children. Is it
strange, then, that infant deaths in London were
so appallingly many?

Yet the field for further educational work
among the indifferent and bigoted is still un-
limited. Notwithstanding the remarkable strides
made in the past decade, the battle has hardly
begun. The forces of public health must be
further strengthened and consolidated if disease
is to be routed from its stronghold and its awful
menace removed from the hearts of mothers and
babes.

For, even with the best scientific knowledge
at their disposal, thousands of citizens maintain
an attitude of skepticism and doubt. Supersti-
tion, sophistry and crass stupidity are still
dominant characteristics in the life of twentieth
century parents. "Easybody" and "Nuisance"
are still favorite epithets hurled at self-sacrif-
icing nurses and doctors who desire only to aid
in the campaign against poverty and disease.

London, however, is extremely fortunate in
having such excellent facilities for public health.
With the Institute of Public Health carrying on
its vital work and producing post-graduates in
public health every year; with Queen Alexandra
Sanatorium at Byron achieving a record for
London of the lowest tuberculosis death rate in
the Dominion; with the University of Western
Ontario medical school pouring qualified physi-
cians from its portals each year; and finally,
with the Children's Hospital, Victoria Hospital
and kindred organizations equipped with the
most modern public health essentials, the future
of this city from every standpoint of public
health is bright indeed.