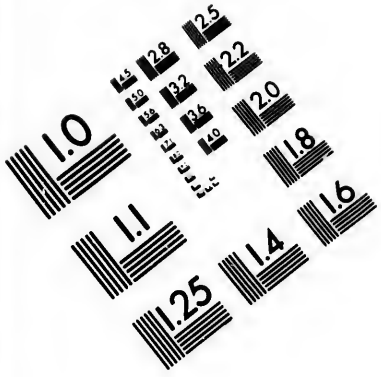

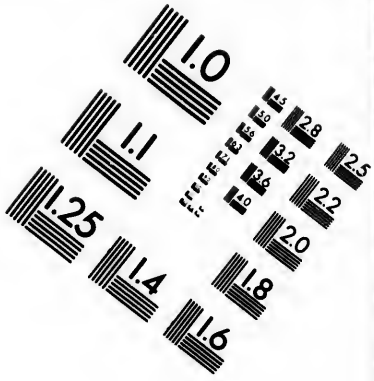

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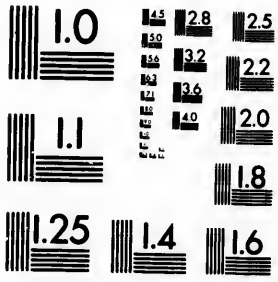

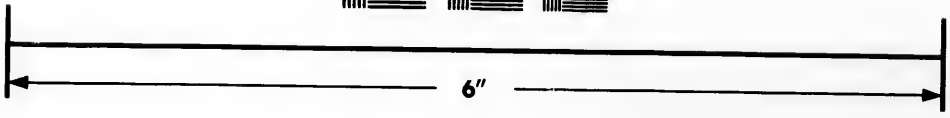

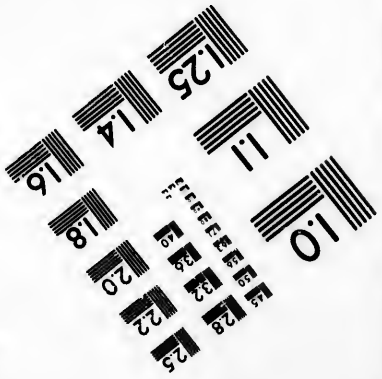

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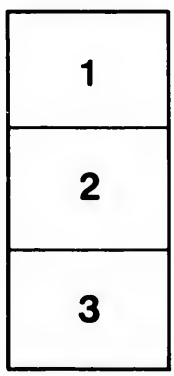

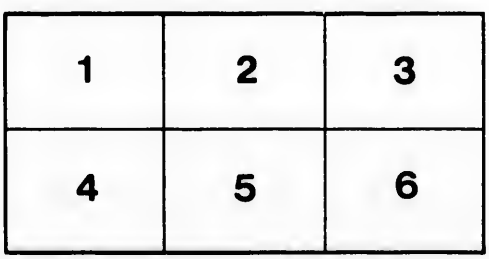

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W. J. Gage & Co's Educational Series.

THE TEMPERANCE PRIMER,

AN

ELEMENTARY LESSON BOOK ON THE NATURE AND EFFECTS

OF

ALCOHOL.

FOR USE IN CANADIAN SCHOOLS.

BY

G. D. PLATT, B. A.,

P. S. INSPECTOR, PRINCE EDWARD COUNTY, ONTARIO.

W. J. GAGE & COMPANY,

TORONTO AND WINNIPEG.

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PREFACE.

The subject of Temperance having with great propriety been placed in the course of study for the Public Schools of Ontario, it is rendered desirable that a collection of the principal facts relating thereto be brought within the reach of teachers and pupils. It may be suggested that this object has already been attained by such excellent works as "The Temperance Lesson Book" of Dr. B. W. Richardson, of England, and other similar publications. These certainly possess features of great merit, but while not detracting from their value in the slightest degree, it is thought, in consideration of the very limited portion of time likely to be devoted to this branch, that a more concise treatise would serve a better purpose.

This little work aims to be such an outline of the subject as may readily be covered by the occasional lessons of the school programme. At the same time it contains a pretty thorough review of the facts and arguments which form the groundwork of the temperance movement.

The author hereby cheerfully acknowledges his indebtedness in the preparation of these pages to the valuable

researches of Dr. Richardson and others who have so thoroughly investigated the nature and effects of Alcohol. The statements made and facts adduced in this little work are all based upon competent and reliable authority, and it is the author's sincere hope that it may contribute in some degree to the instruction of the rising generation in sound temperance principles.

The valuable suggestions and kind criticisms of several friends are hereby gratefully acknowledged

PICTON, June, 1883.

INTRODUCTORY.

"The true end and aim of education is the formation of character." If this be accepted it is evidently the duty of the teacher to press upon the attention of his pupils the great danger of indulgence in the common vices of the day, among which the use of intoxicating liquors stands pre-eminently first—the one great rock upon which the lives of so many of our Canadian youth are hopelessly wrecked. The day is thus past when it may have been necessary to offer an apology for including the subject of Temperance in the Public School programme, and it is justly expected that it will receive from every teacher that attention which its importance demands.

Professor Calderwood, of the University of Edinburgh, in his work on "Teaching," writes thus: "If there be any one vice against which the teachers of our country should seek to warn the young, it is drunkenness. Our national reproach because of this one vice is a bitter one; our national loss and suffering appalling to a degree not realized by those who do not ponder the statistics of the subject. Intelligence and debauchery cannot go long together, either in

personal or national history. Drunkenness is a vice at which school training should level its heaviest blows." And Dr. Willard Parker, of New York, the Nestor of American physicians, says: "We shall never control Alcohol until we have taught the people its nature and effects, and I can see no way of doing this except through schools."

In giving instruction in this branch, it is recommended that the lesson be first outlined by the teacher upon the blackboard. This summary, with additional facts brought forward during the lesson, might afterwards be copied by the pupils into their note-books, unless they may be provided with the printed work, which is, of course, preferable. Such a summary of the principal points requiring attention may be found at the end of the book.

TEMPERANCE.

1. Temperance, in its general sense, may be defined as moderation in the use of such things as are not hurtful in their nature. One hardly speaks of the temperate use of arsenic, strychnine, or prussic acid, because they are poisons, and their tendency being to destroy life, it is the part of wisdom to abstain from them altogether. Recent investigations have fully established the fact that drinks containing Alcohol are also poisons, and hence the term **Temperance**, as applied to them, **has come to mean total abstinence from their use as a common beverage.** There is still a place for them among the drugs employed by the physician, although even that field is greatly diminished in the practice of leading men of the healing profession.

2. The practice of temperance, as it relates to intoxicating liquors, is a very old one. More than a thousand years before the Christian era, both in China and Egypt, the use of wine was strictly forbidden, while among the Greeks drunkenness was a crime punishable at one period by death, and on several occasions the vines were destroyed as a means of preventing the evil.

The first temperance societies of modern times appear to have been formed in Europe during the fif-

teenth century, and are said to have been productive of much good. It was not, however, until the beginning of the present century that anything like a widespread temperance movement took place. This originated in the State of New York, and gradually spread to several others of the United States, afterwards reaching Ireland, Scotland, and England about 1829. The first object of these societies was abstinence from distilled spirits only, but it soon became evident that the use of wine and beer produced results almost as disastrous as the drinking of the stronger liquors. This discovery led to the adoption of the thorough, total abstinence pledge as the only satisfactory remedy for the evils of intemperance.

The first temperance societies of Canada were formed about fifty years ago, and have grown into a variety of organizations which have their representatives throughout the entire Dominion. Great progress has been made in the growth of the public sentiment on this important question, and the present outlook seems to indicate that the time is not far distant when the traffic in strong drink shall be hedged about with such repressive laws as shall confine it to its legitimate field in medicine and the arts. Already in our own country legislation is tending in this direction, while the voices of the ministers and most of the members of the Christian churches strongly unite in favor of entire prohibition.

In the neighboring Republic some of the States have already attained this, and in many others determined efforts are being made to secure it by a prohibitory amendment to the State constitution. In Great Britain very marked progress has lately been made in the spread of temperance principles, as shown by the increased activity of the churches in this work —the advanced position in favor of total abstinence taken by large numbers of medical and scientific men —and the adoption by the House of Commons of the principle of local option, that is, permitting each district to choose whether licenses to sell intoxicating drinks shall be granted within its bounds.

INTOXICATING LIQUORS.

3. This term is applied to **all those artificial drinks which produce intoxication** or drunkenness. They are called **artificial** to distinguish them from water and milk, the **natural** drinks supplied by our Creator for the support of life and health. But man, whose skill is often misapplied and productive of evil, has sought out many strange beverages.

4. WINE is the oldest of the artificial drinks, having been known from the earliest period of history. It is made from grape juice by a process called **fermentation**. The grape juice, which contains a good deal of grape sugar, is allowed to stand in a warm place for three or four days, when it begins to putrefy

or decompose or **ferment**—that is, a part of the grape sugar is changed into **alcohol** and **carbonic acid.** In a few days the fermentation ceases, the juice settles, becomes clear, and is put into bottles or casks. It is now **wine,** an intoxicating liquor, because it contains alcohol. If, instead of being bottled, it were to remain exposed to the air for a few days, it would become sour. In order to prevent this, more alcohol is often added to the newly-made wine; this is called **fortifying** it.

5. All wines, whether foreign or home-made, are produced in a manner similar to that above described, and all contain more or less of the intoxicating principle, alcohol, and **are therefore poisonous in their nature.**

Home-made wines are thought by some to be harmless drinks, and their use is therefore approved by many people who are strongly opposed to the drinking of intoxicating liquors in general. But by the use of such wines a taste is formed at home which afterwards leads many to seek the stronger drinks, and sometimes results in the formation of intemperate habits. **Any drink containing alcohol is dangerous, and should be avoided.**

Dr. Norman Kerr, of England, says: "If there is one thing plainer to me as a medical man than another, it is that intoxicating liquors are, as their name implies, poisons, destroying more lives than all other poisons put together."

6. BEER is the name of another intoxicating liquor invented by the ancients. It is said to have been first made by the Egyptians by pouring hot water on barley and allowing it to ferment. The method at present adopted may be briefly described as follows:—The barley is first soaked in water for about forty-eight hours. It is then put into heaps so that it will get warm and begin to sprout or grow. At this stage a substance called **diastase** is formed, which has the power of changing the starch of the grain into sugar. Next, to prevent the barley becoming too hot, it is spread out in thin layers upon a floor and is turned over every day for about two weeks. The sprouted barley is then dried in a kiln to stop its growth, and the buds or sprouts are removed from the grain, which is now called **malt.**

During the process a considerable loss of material occurs, as 100 parts of barley yield but 80 parts of malt.

7. In making beer the malt is first coarsely ground and steeped for a short time in hot water to dissolve the sugar present in it. The dissolved sugar, called **sweetwort**, is then drained off, leaving behind the husks and refuse, which are taken to feed cattle and pigs. Here again there is a loss of material of about one-half. The sweetwort is next boiled with hops, and after being allowed to settle, the clear liquor is drawn off and cooled. Then yeast is added to produce fermentation, the liquor undergoes the

process of **cleansing** or **fining,** and finally becomes **beer.**

8. Further loss of material ensues in the later stages of beer-making, by which still more nourishment is wasted. According to Dr. Ridge, of England, 100 lbs. of good barley become 80 lbs. in malting; by dissolving in water to make sweetwort and throwing the refuse away it becomes 40 lbs.; by fermentation the solid matter is reduced to 20 lbs., and by cleansing and fining it becomes 10 lbs.

"The 100 lbs. of barley make about 18 gallons of beer, in which there are only 10 lbs. of solid matter, and this far from being the most nourishing part of the barley—in fact no one would think of eating it as food."

"In 100 pounds weight of beer there are about 89 pounds of water; 6 pounds of alcohol; 5 pounds of solid food."

It is thus seen that a man would need to drink **twenty ounces of beer to get one ounce of food,** and that by no means of good quality; but besides the food, which may be of slight value in sustaining life, he must take about an equal quantity of alcohol, which has a positive tendency to destroy life. Instead, however, of taking the alcohol for the sake of the nutriment in the beer, the drinker is attracted chiefly by the intoxicating ingredient, for if the beer be boiled the alcohol is driven off and the remaining liquid becomes very unpleasant to the taste.

The liquors known as ale, porter, stout, &c., are also made from malt by a similar process, and differ very little from beer or from each other.

9. SPIRITS is the name applied to another class of intoxicating liquors. They are produced by distillation and contain a large percentage of alcohol. The process of distillation was discovered about the middle of the eleventh century.

If a small quantity of wine be placed in a retort connected with an empty receiver and sufficient heat be applied, the alcohol soon begins to rise from the wine as an invisible vapor, and passing over into the cool receiver is condensed drop by drop, and becomes again a liquid. This is **spirit of wine**, and the process is **distillation.**

In this way wine was first discovered to be composed of alcohol and water. This discovery is said to have been made in Arabia, whence after a time it became known to the Spaniards, who, in turn, introduced it into Ireland. When the distilled spirit began to be used as a drink it became known under various names. The name **whiskey** is from Ireland, **brandy** from Germany, **gin** from Geneva, and **rum**, made by distilling the fermented molasses of the sugar cane, is said to be from the Malay peninsula. The true brandy is always distilled from wines, but both it and whiskey are now mostly obtained from fermented grain, and even from potatoes, beets, and turnips. The difference in the appearance of brandy and rum is caused

by the application of burnt sugar as a coloring matter.

10. The spirits above enumerated, gin, rum, brandy, and whiskey, contain about fifty per cent. of alcohol, and are therefore the **most injurious and dangerous of the intoxicating drinks.** After them come wines, which are of various degrees of strength, from ten to twenty-five per cent., and lastly, ale, beer, and cider, containing from three to ten per cent. of alcohol.

In order to represent the relative strength of the different alcoholic drinks, Dr. Ridge furnishes the following table :—"One ounce of true or absolute alcohol is contained in each of the following :—

One imperial pint of		Porter.
Three-fourths	"	Stout, pale ale, or cider.
One-half	"	Strong ale or British wines.
Two-fifths	"	Champagne or claret.
Three wineglassfuls of		Sherry.
Two "	"	Port.
One "	"	Brandy, rum, gin, whiskey."

ALCOHOL.

11. We have seen in the preceding pages that the intoxicating principle in artificial drinks is alcohol. On account of its great affinity or liking for water, the pure substance is procured with great difficulty, even the strongest spirit obtained by distillation not being absolute alcohol. It is a clear, colorless liquid of a

burning taste and peculiar smell. **It is a powerful narcotic and irritant poison, destructive of both animal and vegetable life,** and is nowhere to be found in the realm of nature. Its only source is the fermentation of sugar, and it may be produced from all vegetable substances containing either sugar, or starch, which is readily converted into sugar, as we have seen in the manufacture of beer.

Alcohol burns readily, and is therefore used in the spirit-lamp to produce heat without smoke. It is lighter than water and boils at a much lower temperature. It possesses another property of considerable value—it never freezes, and is therefore useful in the construction of thermometers required to measure an extreme degree of cold. It is also useful in the laboratory of the chemist as the solvent of many substances employed in medicine and the arts.

Proof spirit contains about an equal amount of alcohol and water, and is so called from having been **proved** to be equal to a given standard. Where less than fifty per cent. of alcohol is present the liquor is said to be **under proof,** and where more is present **over proof.**

COMPOSITION OF ALCOHOL.

12. An elementary substance is one that cannot be decomposed. The ancients first proclaimed the elements to be earth, air, fire, and water, but modern

chemists have discovered upwards of sixty elementary substances. They have separated water into two gases—oxygen, represented by *O*, and hydrogen by *H*—and have shown air to be a mixture of oxygen and nitrogen (*N*). They have also taught that fire is produced by the union of *O* with the carbon (*C*) of wood or coal, both being composed mostly of *C*, which exists alone as a solid, but in union with *O* forms a poisonous gas known as carbonic acid.

Oxygen is a gas of an active, fiery nature; it unites readily with most of the elements, and is the chief supporter of combustion. If the air we breathe were composed wholly of *O*, animal and vegetable life would be carried on at such a rapid rate by this active agent that it would soon come to an end—hence the *O* is diluted with *N*.

Hydrogen, also a gas, is the lightest of the elements, and being 14½ times lighter than common air, is used in filling balloons. It is combustible, and burns with a pale flame, tinged with yellow. When hydrogen burns it combines with the oxygen of the air and produces water, which is formed by the union of two atoms of *H* with one of *O*—thus, *HHO* or H_2O = water.

In the formation of alcohol both oxygen and hydrogen are employed, together with a third element, carbon, as follows:—two atoms of *C* unite with six of *H* and one of *O*—thus, *CCHHHHHHO*, or C_2H_6O = common alcohol, technically known as ethylic alcohol.

13. It is thus seen how alcohol resembles water in its composition, and in what respects it differs from it. Alcohol contains much more combustible matter, and so burns in the air, which water will not do. Alcohol is much less simple in its composition than water, and is only obtained as the result of a chemical process. Although its source is the natural grains and fruits, yet it does not exist in these as **alcohol**, and therefore **is not a natural product.** For the starch of the grains must be converted into sugar, and this sugar, as well as that of the juices of fruits, must undergo fermentation, before alcohol is produced. During fermentation the pleasant, useful sugar is partially decomposed or broken up into carbonic acid and alcohol—two substances that are very powerful and destructive in their nature.

ALCOHOL AS DRINK

14. **The natural drink of men and animals is water,** the beverage which God has abundantly supplied to nourish and refresh His creatures. **This is essential to life;** nothing else can, or ever does, take its place. For, though a man may confine himself exclusively to one or more of the strong drinks we have described, it is the water in them that supplies the needs of the body. It is this which gives to our bodies their size and rounded, smooth appear-

ance. Take away the water from them and they would become dried up like mummies.

Water is the great solvent of the different substances used as food, and forms the greater part of the juices by which our food is digested. The saliva is said to contain ninety-nine parts in the hundred of water, and the gastric juice ninety-seven parts in the hundred. The blood itself contains seventy-nine parts of water in the hundred, and even the muscles are shown to have seventy-five parts, and the brain not less than eighty parts of water in the hundred.

Thus it may be seen how absolutely we are dependent upon this precious fluid during every moment of our existence, and how great is the folly, to call it by no stronger term, of those who seek to displace the free, pure, life-giving beverage by compounds that, so far from being adapted to the needs of the body, are acknowledged to have a tendency to destroy life rather than to nourish it. For alcohol is a substance altogether foreign to the body, possessing no property that is necessary to any of its organs or functions. Alcohol is powerless to dissolve the materials used as food—on the contrary, one of its leading properties is to harden and preserve. It is not a substitute for water in any of the juices or tissues of the body, in fact it works mischief wherever it goes. It is an enemy intruding its poisonous presence into the blood and vital organs. and producing irritation to such an extent that most of it is thrown off by the

lungs, skin, and kidneys. It is prevented from working fatal injury at once upon the delicate tissues by being so largely diluted with water that its full power is not felt.

Moreover the **desire for strong drink is not a natural one,** but is created by habit. The universal impulse, after a first taste of strong, intoxicating liquor, is to spurn it as a deadly thing—a convincing proof of its unfitness as a drink for man.

ALCOHOL AS FOOD.

15. But if alcohol be of no value as **drink,** may it not prove useful as **food?** This seems to have been held until quite recently as a very general opinion among the users of strong drink. Perhaps those most interested in making out a good case for their favorite beverage did not examine the subject very thoroughly. The recent investigations of scientific men have completely disproved the theory that alcohol is useful as food.

It is not denied that average samples of beer contain about one part in twenty of a kind of food material, but it is more so in name than in reality, and is to a very slight degree assimilated in the body. Baron Liebig, the celebrated German chemist, says:—"If a man drinks daily eight or ten quarts of the best Bavarian beer, equal to lager beer, in the course of twelve months he will have taken into his system the

nutritive constituents contained in a five-pound loaf of bread." Rather an extensive outlay for so small a benefit! Dr. Hargreaves says on this point:—"Let no one deceive himself by taking beer to be nourished. Thirty years' experience and scientific investigations have established the fact that it does not nourish."

But it may be objected by the beer-drinker that it is not reasonable to suppose that beer made from good barley should contain so little of its nutritious properties. It must not be forgotten, however, that **these nutritive qualities are being constantly removed** during the successive stages of manufacture, so that the residue suitable for food is found to be exceedingly meagre in quantity, and very indifferent in quality—especially as the grain must be brought to a half-rotten condition in the early part of the process.

When, through unfavorable harvest weather, the farmer is compelled to leave his wheat in the field until it sprouts, it is found to be unfit for food, because it has begun to rot or decay. **All alcoholic liquors are, in a similar way, the product of decay,** and so far as affording wholesome food is concerned, are therefore most unsatisfactory and delusive.

It is also stated that some of the best varieties of wine contain a small amount of food-material in the form of grape sugar, and are thus of some value as

nourishment. These wines are so rare, however, that it is hardly necessary to take them into account.

16. But even the small proportion of food-material found in beer and some wines is altogether separate from the alcohol, and is totally wanting in the stronger spirituous liquors such as brandy, whiskey, &c. These contain nothing that can be assimilated or changed into flesh and blood by the vital powers, in building up the body and supplying its waste. They are quite unlike **milk**, which is a true, natural food, and supplies the elements required by the body for its sustenance and growth, and in a form such that they may be readily assimilated. Milk is not spurned at the first taste, nor does it irritate and burn the mouth and throat as is the case with alcohol. Children subsist entirely upon milk, and even grown people might find it sufficient to maintain health and strength. But how long could they subsist on alcoholic liquors? The mere supposition is an absurd one!

17. The only reasonable ground of possibility that such drinks may be useful as food—namely, the fact that alcohol is composed so largely of carbon and hydrogen, which are heat-producing elements—has been clearly disproved by the experiments of Dr. Richardson and others. These have shown that, though there is a temporary warmth and flushing of the skin in consequence of the increased action of the heart after taking alcohol, this is invariably followed by a falling of the bodily temperature below the

natural standard. Dr. R. says:—"Thus, by particular and varied experiment it was placed beyond the range of controversy, that alcohol, instead of being a producer of heat in those who consume it, and therefore a food in that sense, is a depressor, and therefore not a food in that sense." Dr. N. S. Davis, of Chicago, also states:—"It is proved with all the force and clearness of a mathematical demonstration that alcohol is in no sense food; neither furnishing material for the tissues, nor fuel for combustion, nor yet generating either nervous or muscular force." And the same author further says:—"The increase in weight of some consumers of intoxicating liquors is not from increased nutrition, but from retarding the waste and retaining the old and effete matter longer in the tissues. This impairs the vitality of the system and predisposes or prepares it to yield to morbid influences of any kind to which it may be exposed."

It is thus seen that instead of taking the place of food in nourishing the body, alcohol destroys to some extent its beneficial effect. And the old notion that a drinker of alcohol can better endure extreme cold than an abstainer, has also been amply disproved by observations during recent Polar expeditions. These have shown unmistakably that men who practise total abstinence are far less liable to injury from the severity of high latitudes. In the language of Dr. Ridge:—"The experience of all observers in Arctic expeditions and cold climates conclusively shows that alcohol

is not only utterly unable to warm the body, but renders the system unable to produce as much heat as it otherwise would, and so exposes it to danger and to death."

THE EVIL EFFECTS OF ALCOHOL.

I. Its Effects on Digestion.

18. Digestion is the process by which the materials of our food are so changed as to be made fit to enter the blood. The most important organ of digestion is the stomach, where the food remains longest, and in which it is acted upon by a powerful fluid called the gastric juice, that mixes with and dissolves it into a substance called **chyme.**

The effect of alcohol will, of course, be less or greater according to the quantity of water with which it is diluted; but in any drink in which it is present, its first action is to irritate the delicate lining of the stomach just as it irritates and inflames the mouth. In the case of habitual drinkers, this irritation becomes chronic and develops into ulceration. In this state the stomach is unable to perform its natural duties, and indigestion is the result.

19. But alcohol acts upon the gastric juice itself, rendering it less able to digest the food, thus delaying the process and tending to ill-health. Its evil effects upon the stomach would be much more marked,

were it not for the fact that it is soon absorbed by the coatings of that organ and so gets into the blood, by which it is promptly carried to the liver. Here again its action is very injurious, frequently causing inflammation and chronic disease, ending in dropsy and death.

20. The digestion is also seriously interfered with by the effect of alcohol upon the nerves which regulate the action of the stomach. These are partially or completely paralyzed, and lose their controlling power to such an extent that the food is allowed to pass out of the stomach in an undigested state. This works injury to some of the other organs by overtaxing them with work that they cannot properly perform. The belief that alcohol aids digestion is thus found to be false. On the contrary, in the words of Dr. Cheyne, "Nothing more effectively hinders digestion than alcohol."

21. Another injury wrought through the nerves is the loss of appetite that occurs to the habitual users of strong drink. The desire for food is the natural expression of a real want of the body, but alcohol deadens the sensibility of the nerves of the stomach by which the want is made known, and thus prevents the feeling of hunger. This experience leads some people into the false belief that alcohol can supply the place of food—a very mistaken notion, as we have already seen.

II. Its Effects on the Blood.

22. The blood is the life-current of the body; that which carries the nutritive particles furnished by the food to every part, supplying heat and nourishment. It is forced out from the heart through the arteries, returns to it through the veins, and is then sent to the lungs to be purified and re-vitalized before it is again sent out on its life-giving mission.

The nutritive part of the blood consists of a great number of very minute globules, mostly red, called **blood corpuscles.** They are so small that 3,000 can lie side by side in a single inch, and are like jelly in their nature. In their passage through the body these little corpuscles **absorb carbonic acid,** a substance very injurious to life, and convey it by way of the heart to the lungs, where it is given off and thrown out by the breath we exhale. The same corpuscles immediately **become charged with oxygen,** an essential supporter of life, from the air which is inhaled, and their color is at once changed from dark red to bright red. This is due to the oxygen absorbed, which is distributed to every part of the body and carbonic acid again taken up in turn. So the work constantly goes on and we are preserved in health and vigor.

But when alcohol gets into the blood the little corpuscles become shrivelled or corrugated, because a portion of water has been taken from them by the alcohol, which has such a greed for water. Being thus

changed and reduced in size, these corpuscles **lose some of their power to absorb oxygen,** and so the life-current lacks a portion of its vitality. Hence, the bodily powers are weakened and become less able to endure exercise, and the system is not so strong to resist the attacks of disease. Hence, too, confirmed drunkards are always sensitive to cold, and are more subject than others to serious affections of the lungs.

23. When considerable alcohol is taken it often causes the corpuscles, made smaller by loss of water, to adhere to one another in masses, and thus to hinder the free passage of the blood through the small vessels or capillaries. This leads to congestion of the organs in which it takes place, and in time to serious, if not fatal, disease. If the amount of alcohol be excessive, the result is a coagulation or thickening, by which the course of the blood through the vessels is stopped, and death by paralysis or apoplexy frequently ensues.

24. It is not the stronger liquors alone that act injuriously upon the blood. The effect of ale and beer **is to render the blood impure and unfit for circulation.** Beer-drinkers are often men of large size and robust appearance—the very picture of health. But let an accident befal one of them requiring the slightest surgical operation, and the result is very often fatal in consequence of the diseased condition of the blood.

Dr. Grindrod says, "A London beer drinker wears his heart upon his sleeve, bare to a death-wound even from a rusty nail or the claw of a cat." Sir Astley Cooper was once called to attend a powerful-looking man who had injured his finger by the splinter of a stave, and though the wound was trifling, it proved fatal in consequence of the impure condition of the blood brought on by beer-drinking. Dr. Buchan says, "Malt liquors inflame the blood and tear the tender vessels of the lungs to pieces;" and Dr. Gordon states, "The moment beer-drinkers are attacked with acute diseases, they are not able to bear depletion, and die."

25. Again, **alcohol influences the supply of blood** sent to different parts of the body. This supply is under the control of the nervous system, which communicates directly with the arteries. But alcohol paralyzes the nerves, and thus prevents them from exercising their usual control. Hence the arteries, freed from their natural restraint, relax more or less, and therefore more blood flows out along them, causing an unnatural flushing or redness of the skin. The little capillaries at the surface also become enlarged in consequence of the increased pressure, and this enlargement after a time becoming permanent, accounts for the red faces and eyes of those in the habit of drinking strong liquors.

III. Its Effects on the Heart.

26. The proper work of the heart is to force the blood out through the arteries to all parts of the body. This is done by the contraction of its muscular walls, and every time this contraction takes place there is a pulsation in the arteries. This may readily be felt at the wrist, where the artery passes near the surface.

It is computed that the heart of an ordinary man **beats about 100,000 times in twenty-four hours.** In hard work or violent exercise of any kind the action of the heart is proportionately increased, and the bodily powers become the sooner exhausted and require rest.

Now it has been discovered that **alcohol quickens the heart's action** in a similar way to hard work and violent exercise. Dr. Richardson has observed that if "four fluid ounces of alcohol were taken in the twenty-four hours the number of beats of the heart would be increased in that time from 100,000 to 112,226, or 509 extra strokes an hour and eight and a half a minute beyond the natural number. If the quantity taken were six ounces there would be an increase of 17,388 in the twenty-four hours—that is 724 extra strokes per hour, and twelve per minute; and for eight ounces the increase would amount to 24,045 in the twenty-four hours, or 1,000 per hour and about 17 per minute beyond what is natural."

In order to meet the case of those who drink moderately, Dr. R. supposes that only two ounces of

alcohol are taken in the twenty-four hours. "This would cause 6,000 extra beats, equal to lifting a weight of seven tons one foot high. Expressed in another form, the work done may be represented by the process of lifting a seven-ounce weight 35,840 times to the height of one foot each time. Suppose that one was obliged in twenty-four hours to lift so light a thing as a seven-ounce weight with one hand from a table and put it upon a shelf one foot higher than the table. It might not be difficult to do this for a few hundred times, but if it has to be done 35,840 times in twenty-four hours, or 1,493 times an hour, the labor would be so great that the hand would fail in a few hours altogether."

"If in writing two or three hours, the inkstand be placed one foot above the table, the mere matter of raising the hand through that one foot three or four times a minute becomes too fatiguing to be borne. How, then, must the heart be wearied when it is driven to the extra and unnecessary work of lifting nearly half a pound one foot high 1,493 times an hour! If a man were obliged to drive his heart to perform so much labor by running or other severe work, he would think his fate hard indeed. He would say it was like working at the tread mill, but he would not be more wearied, and he would not be so much injured."

As a high rate of motion tends the sooner to wear out a machine, so the increased action of the heart

caused by alcohol is a great strain upon it and the blood vessels connected with it. A period of weariness and depression always follows the unnatural excitement produced by alcohol, and this exhaustion is **caused by failure of the heart.**

Suppose a horse to be goaded to great speed by whip or spur, and this unnatural exertion to be kept up for several hours, how thoroughly wearied and exhausted does he become, and if the excessive work be frequently repeated, he is prematurely worn out. And is it to be expected that such an overworked organ as the human heart, which is ever busy, day and night, may be often subjected to a heavy, extra burden without having its strength permanently impaired?

This explains the fact that so-called moderate drinkers, even in the prime of life, frequently sink under ordinary diseases from which an abstainer easily rallies. The heart is required to do some extra work to meet a sudden emergency in the conflict with disease, but is incapable of bearing the strain put upon it, and the patient dies—nominally from some ordinary complaint, but **really from the evil effects of alcohol.**

26. One of the most fatal forms of heart disease produced by the use of alcohol, is what is known by the physicians as **fatty degeneration,** in which portions of the muscular fibres are changed to fat, and the heart is thus rendered unable to perform its proper functions. A similar change sometimes takes

place in the walls of the blood vessels and causes them to burst. Dr. Norman Kerr says, "To drink I have been able to trace three-fourths of all my cases of heart disease." A large portion of the sudden deaths that take place are thus due to the effects of drinking alcoholic liquors, and **might be prevented by the practice of total abstinence.**

IV. Its Effects Upon Muscular Strength.

28. The muscles are those masses of flesh or lean meat by which the movements of the limbs and other parts of the body are produced. They are composed of fleshy strings bound together in bundles of various sizes, according to the place for which they are required. For instance, the arm is moved by large muscles, and the eye by very small ones.

These are the parts of the body directly exercised in work, and it is found by experiment that the use of alcoholic drinks weakens the muscular contraction, and so hinders work. For it is certain that a large dose of alcohol will, in a short time, completely destroy muscular power and render a man helpless. We infer from this that a less amount of alcohol must have some effect in the same direction. But again, the muscles contract under the stimulus derived from the nerves, and these are almost immediately affected by the drinking of alcohol.

Hence men who have hard work to perform are in better condition and accomplish more when they avoid

intoxicating drinks. Men who go into training for trials of strength in rowing, racing, etc., have learned the necessity of abstaining from all indulgence in such drinks. Edward Hanlan has given his emphatic testimony to the same effect, and Dr. Andrew Clark, of London, who had the opportunity of observing ten thousand persons every year, says, "I will risk all on the statement that alcohol is not a helper, but is a hinderer of work."

Dr. Parkes, of England, who conducted most painstaking experiments in order to test this question thoroughly, employed two gangs of men as nearly equal physically as possible to do similar work. One gang was permitted to use beer, and the other was allowed no intoxicating liquor to drink. For a short time the beer-drinkers gained a slight advantage, but at the end of the day they were left far behind by the others. Next day the practice was reversed, and again it was discovered that the gang abstaining from intoxicating drink were much in advance of the others who had been successful the day before. He sums up the result of this and other experiments by saying, that "Alcohol not only does not help work, but is a serious hinderer of work"; and Dr. Bell also testifies, "Alcohol always diminishes the strength of the body and renders man more susceptible to disease and unfit for any service in which vigor or activity is required."

V. Its Effects on the Brain and Nerves.

29. The nerves are white pulpy cords reaching from the brain and spinal cord to every muscle and part of the body. They are of two kinds, **nerves of sensation, and nerves of motion.** They form the means of communication with the various parts of the body. They are a sort of telegraphic system by which messages or impressions are transmitted to and from the brain as the centre of nervous influence and chief organ of the mind. For instance, if one's finger come in contact with the fire, an impression or sensation of pain is promptly sent to the brain, which instantly returns the order to withdraw the finger.

30. Now, we have seen that alcohol irritates and burns whatever part of the body it touches. This is particularly the case with the susceptible material of the brain. So quickly does this poison act that in a very few minutes after being swallowed its injurious effect is felt in the head and manifested by the body. People sometimes refuse to taste liquor, because, as they say, "it flies to my head."

The first sensation produced is one of excitement and pleasant exhilaration, but this is quickly followed by a state of stupor arising from the diminished sensibility of the nerve-structures, and thereby a lessening of the consciousness of impressions, whether from cold or heat, weariness or pain.

31. It is this anæsthetic effect of alcohol that leads to its use by those who seek relief from pain or sor-

row. But it cannot remove the cause — it only paralyzes the nerves and thus deadens the unpleasant sensations. While it is doing this, however, it is working sad injury to the delicate brain and nerve-material; for if the quantity of alcohol consumed be sufficient, complete paralysis and death are the result.

After the stage of mental exhilaration is passed, in the words of Dr. Richardson, "The function of the higher mental centres is depressed, the mere animal centres remain uncontrolled masters of the intellectual man, and the man sinks into the lower animal in everything but shape of material body." Hence it is easy to understand why habitual indulgence in strong drink often permanently dethrones the reason and destroys the moral sensibilities, leaving the man a complete mental and moral wreck.

32. The evil effects of alcohol are more marked upon active thinkers than others. As it impairs the nutritive qualities of the blood, the brain is but imperfectly nourished, and under the wear and tear inseparable from constant mental toil an absolute wasting of its substance often takes place. Dr. R. says of brain-workers "That they are the least able to bear up against the ravages of alcohol — the men most likely to be deceived by this traitor who enters the most precious treasury, the citadel of the mind. These are the men who break up at their work, whose suns go down at noon; these are the men dying at this day at a rate alarming to contemplate."

V. Its Effects upon the Mind.

33. The mind is the controlling part of our complex nature, the presiding intelligence which really constitutes the individual. As it operates through the body as its instrument, it is affected to a greater or less degree by whatever affects the body. The drinking of alcohol, as we have seen (Art. 30), directly affects the brain, which is regarded as the chief organ of the mind. By stimulating the circulation it causes a greater amount of blood to flow to the brain, thus inducing mental activity and excitement to such a degree that the power of self-control is lessened, and the power of perception and judgment greatly weakened. This is why intoxicated people often act in such a foolish or passionate manner. The mental powers are obscured, and the passions have full play, uncontrolled by the reason and judgment. The conscience is also blunted by the same poisonous influence, and men are led to say and do things that would shock them in their sober moments. They become like machines without proper regulation or control, and are impelled by whatever passion may be predominant. It is in such conditions that murder and other horrible crimes are often committed, for which offended justice exacts the life or the liberty of the offender.

Thus the imperial intellect, that crowning glory of man, is dethroned by means of the subtle adver-

sary, alcohol, and all that is noble and God-like in the human organization is brought to the level of the brutes that perish.

34. Every case of ordinary intoxication must be regarded as a temporary madness. It is not, therefore, to be wondered at that the habitual use of alcoholic drinks very often results in permanent madness or insanity. From careful inquiry it is ascertained that from 20 to 60 per cent. of the inmates of asylums for the insane are there in consequence of the direct or indirect effects of alcohol. Dr. Howe, of Boston, testifies that "Of 300 idiots, 145 were found to be the progeny of habitual drunkards"; and Lord Shaftesbury, for 16 years chairman of the Commission on Lunacy, says, "60 out of every 100 come to these asylums directly through drink." Of the **indirect** effects, the saddest and most important phase is the hereditary taint clinging to the descendants of the habitual users of strong drink. Dr. Norman Kerr, of London, says, "The most saddening, and perhaps the most serious, of the numerous evils inflicted by alcohol on human kind is the hereditary transmission, both of the drink-crave itself, and of the pathological changes caused by indulgence in alcohol."

It is frequent matter of observation that the children, and even the grand-children, of drunken parents have an unnatural and over-mastering appetite for strong drink that is almost irresistible. In this

way a man may be the progenitor of disease and crime in another generation, and so far from leaving his children a heritage of blessing, may weigh them down with curses that will ruin them forever and help to blast the generation after them. This possibility is fully borne out by the testimonies of competent scientific observers. Darwin the great naturalist, states, "It is remarkable that all diseases from drinking are liable to pass from father to son even to the third generation, gradually increasing if the course be continued, till the family be extinct."

35. But we cannot close this part of the subject without placing greater emphasis upon the statement that **the habitual use of alcohol weakens the will.** This is the first great step towards that mental, moral, and physical degradation which so often results from strong drink.

When a man first partakes of it his will is supreme —he has the power to refuse if he chooses to do so. If asked to deny himself lest his indulgence may grow into a habit, he replies that "there is no danger"— "he can stop at any time." But with continued indulgence an unnatural appetite is being created, and the power of self-control is being gradually impaired. The higher and nobler faculties of his nature are being surely undermined and weakened, while the baser passions are stimulated and strengthened. After a time he arrives at a stage in his downward career

when he would be glad to break off his evil habit, but is unable to do so. His will is no longer supreme — appetite has usurped the throne and is now king, ruling its subject with an absolute sway. This is no fancy picture, but is unfortunately too often exemplified in this and other countries. The one important lesson to be deduced is, that **total abstinence from intoxicating liquors is the only safe practice for young and old.**

VII. Its Effects on the General Health.

36. From the facts given in the preceding pages it is clearly seen that the use of intoxicating liquors injures the general health and materially shortens life. Further proof of this statement is to be found in the fact that Life Assurance Companies, from a careful study of vital statistics, have not only come to refuse the application of men given to the excessive use of strong drink, but even to require a higher premium from moderate drinkers than from total abstainers. One such company in England, with a general section for moderate drinkers and a temperance section for abstainers, shows the following results :—Among the moderate drinkers 3,450 deaths were expected, and 3,444 actually occurred, while among the abstainers 2,002 deaths were expected, and only 1,433 were realized in the given period ; in other words, 975 more deaths occurred in that period through the use of alcohol."

37. Leading medical men throughout the world also agree that the use of alcohol renders people more liable to disease and prolongs the illness of those who recover, while very many deaths are indirectly caused by it, though said to be the result of other diseases.

Sir W. Gull publicly stated before a committee of the House of Lords:—"A very large number of people in society are dying day by day, poisoned by alcoholic drinks without knowing it, without being supposed to be poisoned by them. I hardly know any more powerful source of disease than alcoholic drinks. I do not think it is known, but I know alcohol to be a most destructive poison, I should say from my experience that it is **the most destructive agent** that we are aware of in this country."

Sir H. Thompson, surgeon to University College Hospital, in a letter to the Archbishop of Canterbury, says:—"I have long had the conviction that there is no greater cause of evil, moral and physical, in this country than the use of alcoholic drinks; I do not mean by this that extreme indulgence which produces drunkenness; the habitual use of them, to **an extent far short of this**, injures the body and lessens the mind's power to an extent which I think few people are aware of. I have no hesitation in saying that a very large proportion of some of the most painful and dangerous diseases which come under my notice arise from the common and daily use of fermented alcoholic drinks, taken in **the quantity which is**

ordinarily considered moderate. As to this fact I feel that I have a right to speak with authority, and I do so solely because it appears to me a duty not to be silent on a matter of such extreme importance."

Dr. Murchison says:—"The daily dose of alcohol induces an unnatural chemistry of the tissues and the circulation of an impure blood which account for the brittle artery, the softened heart, the gouty kidney, and the other evidences of premature decay."

Dr. Willard Parker, of New York, attributes one-third of the mortality of the United States to alcohol. Mr. J. H. Sherman agrees with the statement, and gives 371,300 deaths per year as the number directly or indirectly due to intoxicating liquors.

38. Cholera and other epidemic diseases always reap their greatest harvests among the users of strong drink; indeed, very few total abstainers fall victims to them. This was amply proved by observation during the cholera wave of 1832. Dr. Rhinelander says of Montreal in that year:—"The victims of the disease are the intemperate. Not a drunkard who was attacked recovered, and almost all the victims have, at least, been moderate drinkers." Dr. Sewall, of New York, stated that of 204 cases of cholera in the hospital, there were only six temperate persons, and these had recovered; and Mr. Delavan, of Albany, after careful inquiry published the following:—"Of 336

persons who died of cholera in 1832, 140 were intemperate, 186 moderate drinkers, 7 strictly temperate, and 3 unknown."

When the dreadful scourge of yellow fever visited New Orleans in 1853, it was observed by Dr. Cartwright of that city that about 5,000 drinkers of intoxicating liquors died before a sober citizen was attacked.

39. It is also well known that excessive heat is especially fatal to consumers of alcohol, and that a very large proportion of the victims of sunstroke, so called, is from that class. Sir Charles Napier has reported that soldiers on the march in India who drink spirits are more liable to sunstroke, as they have an **ally** of **the sun** in their brains. Two years ago the *Cincinnati Gazette* contained this item:—"Of the 500 deaths which occurred in this city from the excessive heat, three-fourths, if not a larger proportion, are traceable to the intemperate use of intoxicating liquors."

40. Let it not be supposed that it is the man who drinks to excess, or the drunkard, alone that falls a ready victim to disease. His end may come sooner than that of the moderate drinker, but both are equally certain to be premature. In addition to the testimony already given on this point, Dr. Gordon, in an English Parliamentary report, says:—"Leaving drunkenness out of the question, the frequent drinking of a small quantity of spirits is as surely destructive of life as more habitual intoxication." This is the general

testimony of physicians, and agrees with the hospital returns, which show that nearly four out of five of their patients, whether medical or surgical cases, are there from the effects of strong drink.

Hence, we are warranted in again deducing the emphatic truth, that **total abstinence from intoxicating liquor is the only safe practice.**

VIII. Its Effects on Morals.

41. Man is created with a higher or **spiritual nature** akin to his Maker, and a lower or **animal nature** like the beasts. If he follow the aspirations of the former he becomes God-like in his character, but if he yield to his lower propensities he sinks to the level of the brute. To maintain his proper position as "the noblest work of God," it is therefore necessary that a man be directed by the superior powers of reason and conscience. Anything that interferes with the supremacy of these faculties, destroys the harmony of the human organization and renders it liable to go astray.

42. We have seen (Art. 33) that **alcohol is the enemy of reason and conscience.** By its poisonous influence upon the brain these are obscured, and their power to guide and control are greatly lessened. Hence, the man who is under the influence of alcohol, like a ship without a helm, is driven in whatever direction the winds of passion may blow. No considerations of right and wrong are sufficient to

check his evil inclinations. The ties of friendship are forgotten, and even the more sacred endearments of home are no protection against deeds of violence.

43. If one could exactly represent the numbers of women and children who suffer every year in our country from the wrongs inflicted by drunken men, the picture would be a very sad one. And since these men, when sober, are affectionate to their families, we are justified in charging the mischief done, to the strong drink with which they poison themselves. Nothing else can so influence a man to injure his dearest friends—nothing but alcohol can blot out every humane feeling and prompt him to act more like a fiend than a man.

But the perpetrators of such crimes rarely find their way to prison. Most of the injured ones prefer to suffer in silence the wants of the ordinary comforts of life, and even to bear cruel neglect and violent abuse uncomplainingly, rather than invoke the protection of the law, lest one of the household be branded as a criminal.

44. Not to mention the uncounted wrongs above referred to, alcohol is universally acknowledged to be the most fruitful source of crime, and has a greater number of victims in the prisons of the world than all other causes combined. The most eminent jurists of Great Britain and America estimate the proportion of criminals caused by alcohol at from seventy to eighty per cent. of the whole number

Lord Bacon stated long ago, that all the crimes on the earth do not destroy so many of the human race, nor alienate so much property, as drunkenness; and Sir Matthew Hale, speaking from twenty years' experience, says, "If the crimes and enormities committed during that time were divided into five parts, four of them have been the product of excessive drinking."

The present Lord Mayor of London lately gave it as his experience as a magistrate that "nine-tenths, if not nineteen-twentieths, of the brutality and crime that came before him had their origin in the curse of drink;" and Lord Coleridge, the present Chief Justice of England, a short time ago said, "But for drink we might shut up nine out of ten of our jails." Elisha Harris, M.D., Cor. Secretary of the Prison Association of New York, says, "About 82 per cent. of the convicts in the United States privately confess their frequent indulgence in intoxicating drinks."

From the best information at hand, it is indicated that at least 70 per cent. of the annual arrests in the Province of Ontario are due to this cause, and wherever the baneful influence of alcoholic liquors is exerted, the inevitable result is to fill the prisons with criminals. Without this demoralizing agency there would be very little for judges and juries to do. But as alcohol predisposes to disease by its action upon the body, so by its effects upon the mind it prepares the way for the commission of every species of crime.

THE WASTE CAUSED BY ALCOHOL.

45. When a man pays his money for food he generally receives value for the amount paid, but when his hard earnings go for intoxicating liquor, not only does he fail to receive anything that will benefit himself, but he obtains what will even prove an injury. To pay his money for nothing, or lose it, would therefore be a gain to the man who determines to buy strong drink with it. For, if he drink the alcohol he buys, it will cause some injury to his body, it will have some evil effect upon his moral character, and it will cause some loss of time and strength for work.

46. We will suppose that a man spends the average sum of ten cents per day for intoxicating drink. This would amount to seventy cents per week, about three dollars per month, and thirty-six dollars and a half a year.

If you ask the same man to insure his life for a thousand dollars, or pay thirty dollars a year for some other desirable object, he will probably reply that "he cannot afford it," although either would cost a less amount than his daily indulgence.

But the thirty-six and a half dollars a year is not all that he loses. At a moderate estimate the waste of time caused by drink may be valued at an equal amount, making altogether a financial loss of seventy-three dollars a year, besides the loss of strength and

health resulting from the habit of drinking alcoholic liquors. Now seventy-three dollars a year for the space of ten years would equal seven hundred and thirty dollars, not reckoning interest, and in twenty years would amount to fourteen hundred and sixty dollars—a sum sufficiently large to prove a very welcome aid in the declining years of almost any person.

47. This computation, however, has reference to only one person. Let us glean from the last returns of the Government of Canada a few facts showing the great waste resulting from the vast trade in intoxicating drinks which is now being carried on in this country.

During the year ending June 30th, 1882, 1,436,101 gallons of wine and spirits were imported, and 3,552,818 gallons manufactured, for the use of the people in Canada. During the same time 248,391 gallons of malt liquors were imported, and not less than 12,036,979 gallons manufactured for the same purpose—in all 17,274,289 gallons of alcoholic liquors taken for consumption by less than five millions of people in one year—an average of more than seventeen gallons to every family in the Dominion.

This quantity would require upwards of 2,600,000 bushels of grain to produce it, and would sell at retail for more than twenty-five millions of dollars. Allowing one-twentieth of all this liquor to be devoted to some useful purpose in medicine and the arts, there is

left a direct criminal waste of twenty-three millions seven hundred and fifty thousand dollars a year!

48. This amount is not only a direct loss to those from whose pockets it is taken, but the drink it buys occasions a loss of time and energy that may be estimated at an equal amount, leaving out of the question the value of life and property sacrificed every year to the criminal carelessness of drunken employees in positions of trust and responsibility.

And then, it must be remembered that alcohol is answerable for about four-fifths of all the crime and pauperism, and not less than two-fifths of the insanity of this country. What do these cost the sober part of the community in police protection, administration of justice, asylum maintenance, and support of the poor? The question is more easily asked than answered. The debit side of the account with alcohol is a very large one. Even the capital invested in its manufacture employs only about one-tenth of the number of men that would be employed by an equal amount invested in useful industries. Summing all up we are probably safe in stating that a grand total of **Fifty Millions of Dollars** is wasted every year in the Dominion of Canada upon an article that gives to the purchaser no substantial good, but is a source of positive injury and loss.

49. But a still greater waste—that of human life and happiness—is beyond our power to estimate. It is computed that not less than six thousand people die

every year in this country from the intemperate use of intoxicating drink—an average of more than sixteen victims every day offered at the shrine of alcohol in addition to the moderate drinkers who die from its indirect effects! What desolate homes—what agony of friends—what struggles with the tempter—what sinking in despair, are represented by this statement! And all these were once innocent children! May we not hope that the children of to-day will take warning and **never touch nor taste intoxicating liquor.**

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