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Contributors

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19
A SYNOPSIS

OF THE

Temperance Lesson-Book

OF

BENJAMIN WARD RICHARDSON, M.D., LL.D.,
LONDON.

BY

C. R. AGNEW, A.M., M.D.,
NEW YORK.

ADDRESSED TO THE TEACHERS IN THE PUBLIC SCHOOLS
OF NEW YORK AND BROOKLYN.

NEW YORK :
National Temperance Society and Publication House,
58 READE STREET.
1880.

Juvenile Temperance Manual.

By MISS JULIA COLMAN.

12mo, 162 Pages. Cloth, 60 cents, Paper, 25.

This Manual is intended as a help for teachers and all others who would like to get up a Temperance School. It answers the questions—How shall we start it? How manage it? What shall we teach? How make it interesting? etc., etc. It provides a series of lessons illustrated with experiments, objects, blackboard exercises, and problems; on Alcohol, its origin, its nature, its effects, how to get rid of it; on Tobacco and on Profanity, with Scripture ticket lessons; notices of such books, tracts, leaflets and charts, as can be used for helps. It is also intended to aid the superintendent in explaining and illustrating the lessons in the Catechism on Alcohol, which is now the most popular Temperance text-book for the children.

The plan of the proposed School is novel, simple and ingenious, and commends itself at once to the good judgment of those who are in earnest to do "REAL GOOD WORK."

The book can also be used in all sorts of juvenile organizations and in families; and is entertaining reading for any one. The following is the

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58 Reade Street, New York

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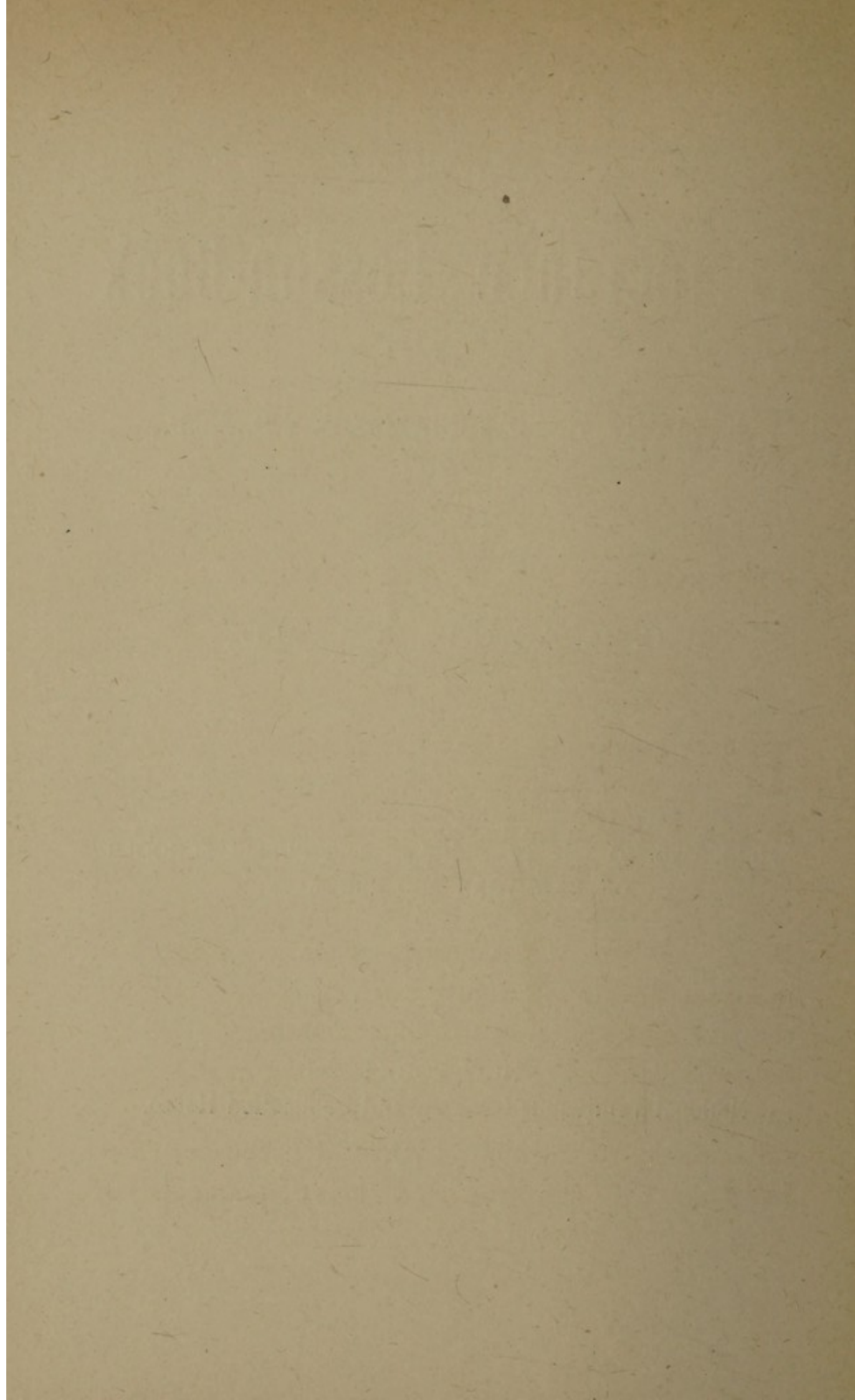
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BENJAMIN WARD RICHARDSON, M.D., LL.D., Fellow of the Royal College of Physicians, England, author of the "Cantor Lectures on Alcohol," of a volume on the "Diseases of Modern Life," and more recently, of the "Temperance Lesson-Book," has done more, perhaps, than any other man in Great Britain to diffuse correct ideas regarding the use and abuse of alcoholic stimulants. He has helped to lift one of the most important in the entire range of educational themes above the level of sensationalism, and to give it a scientific precision which has quenched the criticism of many opponents and

filled the ranks of the temperance advocates with recruits from all ranks of life, and especially from among the more thoughtful classes.

The "Temperance Lesson-Book" was prepared for a committee of the National Temperance League of England, to be used in schools in connection with the great movement for popular education in Great Britain. It treats in a purely scientific, and at the same time simple, manner of the chemistry of alcohol and its physiological action on the human body.

The book consists of fifty-two brief lessons. Each lesson is followed by half a dozen questions to be used as an exercise to test the memory and knowledge of the reader, and so complete as to be valuable in a detached form, and available for giving information to a scholar who may enter a class at any stage of a school session.

A list of the subjects of these lessons is as follows:

1. Artificial Drinks.
2. Natural Drinks.
3. The Water of the Body.
4. Uses of Water in the Body.
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7. Water Drinkers.
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50. Diseases of the Body from Alcohol.
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The first chapter defines artificial drinks as distinguished from the only two natural drinks, water and milk. The second, third, fourth, fifth, sixth, and seventh chapters treat of natural drinks, of the water of the body, of the uses of water in the body, of the water current in the body, of natural food and water drinks, and with great simplicity of illustration. It is shown that the natural craving of animals is for water and milk, and that those fluids are sufficient for any period of their lives; that the greatest speed on earth and in the air and the greatest

physical endurance of all classes of animals, in all the forms of tissue-wearing work, is possible without the use of other fluids than water and milk. "All the animal kingdom, mammals, birds, fishes, reptiles, insects, and microscopical animals, all this vast world of life," says Dr. Richardson, "extending from the Polar Seas to the heated tropics, in the sea, in the air—all those myriads of forms of living motion go through their destined tasks, their sports and work, having as their drink nothing but water."

He then shows the part that water plays in the formation of the animal body, and explains the true value of it to man and other living creatures, showing that it is the principal substance in the vital organs. That water in the living body gives to the parts which move and are active their chief weight and size, and all the soft tissues of the body may be looked upon as water rendered partly solid. That water is the only fluid which will distribute itself through the muscles, and membranes, and bones of a body in such a manner as to carry and spread the substances essential to tissue building and tissue repairing. That it forms 87 per cent. of the bile, 90 per cent. of the pancreatic juice, and reduces our food to a solution or suspends it so that it is fitted to be absorbed or drawn into the blood-vessels and into the current of the blood. That the blood itself

is 79 per cent. water. That through its agency colloid (glue-like) and starchy and fatty substances and salts are made available for tissue building, and that it is a great solvent by which tissue change is accomplished, and the introduction of any other fluid into it—like alcohol, for instance—impairs its usefulness. That it is, in all probability, the carrier of animal heat, and the separator, through sponge-like structures called glands, of those saline substances which come from used-up tissue. It thus carries into the body and through its tissues the materials essential to its nutrition, and out of it those things which have served their purposes and are no longer necessary. Health depends upon the harmonious, unobstructed movement of these currents of water, and the diseases which we suffer are constantly traceable to obstructions which occur in the blood-vessels and other channels, large and microscopic, through which the food-bearing commerce of the body is carried on.

In the sixth chapter, that on natural food, he gives a description of milk. He calls it a standard food, and shows its chemical properties and nutritive value, and that 88 per cent. of it is water.

In chapter vii. he shows that “in the Divine scheme and order of nature there is profusely provided one fluid for the wants of man and other ani-

mals as a drink, and that living bodies are built for water only to be the fluid by which they may live, and that up to this time this plan has not been disturbed by man in respect to any animal inferior to himself."

It is true, moreover, that that which makes artificial drinks potable is the water which they contain; it is also true that that which is added to the water often interferes with its proper action, and renders it more or less impure and deleterious.

In the chapters from viii. to xiii. inclusive we have wine and beer and the general subject of fermentation and distillation treated of from the historic point of view, and the growth of the taste for artificial drinks discussed. He shows how wine was first used at feasts; how it was soon learned that it was bad for those who were about to perform great deeds, and that even at feasts it was injurious if partaken of too freely, and that soon proverbs were framed to express these truths decisively; that the ancients at first used it sparingly mingled with much water; that men under thirty were not allowed to drink it at all, or women at any age. We know, alas! how soon these principles were violated, and how a flood of misery set in which has swept over vast tracts of the world and threatens to engulf the race in ruin.

The "habit of seeking cheerfulness from wine" has turned men from the sources of true joy, and driven them further and further away into that which is sensual and destructive, and in more ways than was known by the Roman feaster the skeleton confronts the convivial drinker at the feast.

Some of the words of the wise against strong drink are then quoted. St. Augustine declares it to be the mother of all mischief, and we are reminded that King Antiochus was killed at a banquet by his minions whom he had forced to take an excess of wine, the latter story reminding us of the lesson so often repeated in history, that "if we tempt others into error the consequences will fall back upon ourselves."

It was not until the middle ages that distillation was applied, and the chemists gave the name of spirits to the light vapors that reached the receiver from their alembic. Albucasis, an Arabian chemist, seems to have been the first who, as early as the eleventh century, obtained "spirits of wine" by distillation from wine. From this discovery dates a most wonderful era in chemistry and the arts. The discovery of sulphuric acid, sulphuric ether, etc., followed. These agents, after lying in the laboratories, some of them for ages, were at last brought out as great forces for good or evil in civilization. Mr.

Stanford says that "aqua vitæ," as the spirits of wine were called, was used as a drink as early as A.D. 1260. The Arabians taught it to the Spaniards, and the Spaniards to the monks of Ireland. In Ireland it took the name of "usige biatha," meaning "aqua vitæ," shortened into "usque baugh," and this again into "usige," from which comes "whiskey."

Dr. Richardson gives much interesting lore about the origin of other strong drinks, into which we may not now go for want of time.

It was not until the latter part of the seventeenth century that spirits of wine were called *alcohol*.

Dr. R., quoting from an old chemist, Lemert, who wrote in 1698, tells us that "alcohol was a term intended to describe something exceedingly refined or subtile."

Chapters xiv., xv., xvi., and xvii. of the book have to do with the composition and properties of alcohol, the common ethylic alcohol, and a comprehensive description of the chemical nature of the substance is given in language that any intelligent child might understand. Moreover, the manner of treating the subject is so felicitous that any child, after having mastered its few difficulties, would be likely to form a taste for chemical studies, and so be led in the direction of the physical sciences.

Chapters xviii. to xxi., inclusive, are devoted to a

scientific but plain and most interesting account of alcoholic drinks, including wine, spirits, and beer, the percentage by weight or volume of ethylic alcohol which they respectively contain, and their relative power as intoxicants. The doctor calls attention to the foolish indifference or ignorance of the people as regards the amount of alcohol taken by them in a vinous or spirituous beverage, as though it were a small matter, and as though wines were of uniform composition. "Take another glass of wine," says one person; "it is so light it cannot hurt you." "Do have another tumbler of beer," says a second person; "it is home-brewed, and contains nothing but malt and hops, and cannot possibly do you harm." "Try one drop of this whiskey," says a third person; "it is of the purest sort—real mountain dew—and will pick you up in no time." "You are drowning your glass," says a fourth, "by pouring in so much water." "This is a spirit that is spoiled if it be too much drenched." So they talk and act as if they were dealing with one of the simplest and most innocent things in the world, instead of one of the most dangerous. He then proceeds to give the facts as to the amount of alcohol in wines as compared with the amount in spirits, and the amount in wines and spirits as compared with that in ales and stouts—details into which we may not go in this brief *résumé*.

The chapters from xxii. to xxv., inclusive, are devoted to a brief description of the alcohol family, showing that it is a large one, all the members of which are "constructed on the same type or plan, and are got by fermentation from organic substances." The alcohol which makes the intoxicating agent in the beverages in common use "is obtained by the fermentation of sugar, of fruit, and of grain." They are all constructed on the same plan, and agree in having a radical compound of carbon and hydrogen, and differ from each other in the parts or atoms of carbon and hydrogen, the carbon increasing by one step and the hydrogen by two as you go up in the series. They all turn sour or acid, making a vinegar, on exposure, and every alcohol has its peculiar vinegar.

With chapter xxvi. he considers the way in which common or ethylic alcohol acts on the human body—the alcohol which exists in wine, spirits, beer, cider, gin, rum, whiskey, brandy, and other common alcoholic beverages. He shows how universal is the effect of alcohol on living animals. "A pigeon will take, without showing any effect, opium enough to kill several men." "A rabbit will swallow belladonna enough to kill several men, and a goat will eat without injury enough tobacco to kill several men." The use of alcohol tends to produce a habit,

and to "become a necessary part of life," "which can rarely be sustained from day to day in any person without an increase of dose."

He DENIES that it is food in any true sense, or that it is an active tissue-builder; that it gives neither water nor any other substance for building up the body. "Some," he says, "allege that it gives warmth and strength." He proceeds to prove, step by step, that it makes the body cold instead of warm, and the muscles weak instead of strong. Comparing alcohol with milk, for instance, it shows no trace of being a food at all.

He then traces alcohol as it is carried, after entering the body, by the veins to the right side of the heart, whence it is thrown upon the lungs, and gives us a very simple analysis of the constitution of the blood, telling us that its red corpuscles are the bearers of the carbonic acid which is to be given up in the lungs and thrown off by every breath we throw out, and how the blood, after receiving the oxygen from the atmosphere in the air-passages, returns to the left side of the heart to be sent to nourish the body and make tissue. He shows that in the blood there are, in addition to the red corpuscles, the relatively large, white, or parent corpuscles, the fibrine, the albumen, the salts, and water, the water making up seventy-nine parts in the hundred. He

asserts that alcohol is a foreign substance in this blood current, that it acts injuriously upon the blood corpuscles and the fibrine, diminishing the power of the corpuscles to absorb oxygen from the atmosphere, and thus the power of oxidation of the blood is lessened and the body made more sensitive to cold, and the vitality of the body greatly reduced.

Alcohol tends to prevent waste or tissue change. Health, other things being equal, depends upon rapid wearing out of tissue and as rapid restoration. The blood-vessels in those who use alcohol being deficient in power, the course of the blood is checked, and the blood itself cannot take up air as it should to prepare it to be food for tissues.

He shows how the alcohol acts, taken in great excess, first, in causing the red corpuscles to shrivel and stick together in masses, and the fibrine to be more plastic or coagulable, and so form foci of disease by making obstructions in blood-vessels; that these obstructions may be very tiny at first, but enough to interrupt or make irregular the supply of blood to important organs, and thus lay the foundation for disease, as where the walls of a twig of a blood-vessel running to a portion of the brain may be made less elastic than they should be, or less permeable, or the calibre of the tube less smooth, and the

way thus prepared for some defect in tissue-building which may lead to apoplexy and paralysis, or to some other persistent morbid state. What happens in the brain may happen also in any organ of special sense, or some other part more or less essential to the life of the individual, and so the foundation be laid for acute and chronic disease, and ultimately fatal disease.

“Alcohol, when it is freely diluted, acts on the fibrine of the blood, rendering it unduly fluid,” and thus creates a tendency to disease similar to that which is produced by persons living a long time on salted provisions. When added to a very scanty or monotonous diet it does not, as has been supposed, add to the nutritive value of such insufficient food, but only diminishes it.

“Two tablespoonfuls of oatmeal with one of pease-meal, made into a liquid with boiling water and milk, and flavored with salt or sugar, form a drink,” says Dr. R., “worth any number of glasses of ale or other alcoholic fluid.”

“Such a drink does indeed maintain the strength and keep out the cold, but alcohol is not a substance that can be used to keep the human body warm.” It is therefore as absurd to take an alcoholic drink to keep out the cold as to take one to keep out the heat. It is proved beyond dispute that alcohol em-

barrasses or stops "the process by which the body is made and kept warm." He shows what the standard temperature of the body is, how it is maintained, and what its relations are to outside temperature and climate; that steadiness of bodily temperature is essential for the perfect life of an animal; and that it is easy by the thermometer to study variations in temperature in health and disease.

Dr. R. gives a brief narrative in chapters xxxiv. to xxxix. inclusive, of the four stages of animal life under alcohol. He shows that when a small dose of alcohol is taken there is caused the first stage of alcoholic influence—there is exhilaration and increased cheerfulness; the mind is quickened in action, and there is a sense of warmth pervading the entire body. In this stage the temperature, by the thermometer, is raised from half a degree to a degree or two. This fact—viz., that the temperature is raised—is true of all animals upon which the experiments have been tried. This increase of temperature is due to weakness of the small blood-vessels in the skin and lining membranes of the body, to which blood is driven by increased heart-action, and the presence in certain tissues of an increased amount of blood at a given moment, so that more heat is set free, given off at the expense of the body. This, the "jolly stage," is, however, soon over; the flush of

the face fades, the mind grows less active, a slight chilliness is experienced, and the animal heat, as tested by the thermometer, is falling. If at this juncture the individual is exposed to cold air the thermometer will show a greater fall, reaching even a degree or two. In this state there is great danger of the individual contracting diseases, such as inflammation of the lungs, or rheumatism, or falling the victim of contagion if contagious diseases are encountered. Many thousands of persons who are never even suspected of excess in the use of alcoholic beverages succumb to disease who are exposed to atmospheric changes or contagion while in this enfeebled condition, and at a stage which is thought to be well inside of the safe line of alcoholic effect; and it is by a kind of instinct that persons so exposed take additional doses to spur their flagging energies. The description which is given in chapters xxxvii., xxxviii., and xxxix. of the pathological conditions which mark the third and fourth stages of animal life under alcohol are graphic, scientific, and indisputable, and also too well known by all, even the most careless observers, to need any special animadversion from us at this time—how the great vital organs of the body, the brain, the lungs, the liver, etc., are embarrassed in the performance of their functions, the brain deranged and the mere brutal

nature of man allowed to assert its sway, and to dethrone the reason and the judgment, and to make a rudderless wreck of an immortal being, reducing him in the final stage to a drunkard. "It is well for every child to understand that a person who is lying down, unable to move naturally, unable to hear plainly, unable to see correctly, to speak distinctly or coherently, and unable to do anything more than breathe and live, must be in a state of danger and disease as bad as any that could be caused by those accidents which we all shrink from, accidents that wound and those that kill."

"If we look at the whole course of the action of alcohol from the first stage to the last we can see no good whatever that is supplied by it. Every step that seems harmless is at best nonsensical, and every step that seems to be hurtful is hurtful beyond anything that I can explain in this little work," says the doctor.

Further he says: "But some people who have not thought carefully on this subject say, and argue very keenly while they are saying it, that strong drink does good when it puts people in good spirits and makes them feel warm and comfortable. They admit that when drinking is carried on to do more than cheer up or exhilarate and make the body feel warm it is a very injurious thing indeed. They ad-

mit that when the strong drink makes the limbs feel unsteady, the memory confused, the thoughts hazy, and the body cold, it does a great deal of harm for which they, even they, are exceeding sorry. They admit all these facts, but they hold that drink must do good when it cheers and warms. To reduce their argument to a very plain matter of fact, they contend that alcohol does no harm so long as its action is confined to the production of the symptoms of the first stage of its action. We have seen, however, that this first stage is really a stage of reduced power, that the warmth or glow which is felt, instead of being a real supply of warmth to the body, is a disengagement, or giving off, of heat from the body ; that the cheeriness which is felt is not due to any increased strength of the body or mind, but to the quicker motion of the blood, and to the actual rapid waste of the powers of the body, and of the structures of the brain through which those powers are displayed. Thus the defence of alcohol has for its foundation the argument that it is good to seek temporary gratification from an agent which by its action in this very direction leads to evil and even fatal consequences."

Chapters xl. and xli. have to do with alcohol and cold and alcoholic chill, to show further the fallacy of the belief that alcohol keeps *out* the cold, or that

it is of any value as a fuel food, and that alcohol and cold go hand in hand in their action.

Chapters xlii. and xliii. are devoted to the subjects of the heart under alcohol and heart work under alcohol. A plain and lucid description is given of the physiology of the circulation of the blood, and the effect of alcohol upon it.

“ In a grown-up man the heart beats, and the strike of the heart and of each pulse-beat is felt, 73 times in a minute ; 73 strokes a minute represent 4,380 strokes an hour, and 105,120 strokes in 24 hours. The heart beats slower when the body is lying down, and a little slower when it is sitting than when it is standing, and we may take off 5,120 strokes, and say that the number of beats of the heart each 24 hours is 100,000. By the work that is done in this way over 5,000 ounces of blood are pumped over the body in 24 hours. The value of this work is represented by saying that a weight of over 115 tons has been raised one foot.” Such is the natural work of the heart under natural circumstances of food and labor, and *without the influence of an alcoholic stimulant*. If we were to watch the action of the pulse under doses of alcohol we should see that it would grow quicker. If the quantity of alcohol taken were 4 fluid ounces in 24 hours, the number of beats of the heart would be increased

from 100,000 to 112,226, or 12,226 *extra beats*, or a little over 509 extra strokes an hour, or very nearly eight and a half strokes per minute beyond the natural number.

If the quantity of alcohol taken were six ounces in twenty-four hours, the number of beats of the heart would be increased 17,388, or twelve per minute beyond the natural amount, etc. Two ounces of alcohol taken in twenty-four hours would increase the beats of the heart to 6,000 extra beats in twenty-four hours, which means an amount of work represented by the act of lifting a weight of seven tons one foot high. "One ton divided into ounces would give 35,840 ounces; so that the work done is really represented by the process of lifting a seven-ounce weight 35,840 times the height of one foot each time."

We see by these simple experiments and arguments what *extra work* is imposed upon the heart for no useful end by even what are called moderate or safe doses of alcohol.

The remaining chapters are devoted to the subjects of "Alcoholic Fatigue," "Alcohol and Muscular Strength," "Alcohol and the Small Blood-vessels," "Alcohol as a Stimulant," "Stimulation and Depression," "Alcohol as a Poison," "Diseases of the Body from Alcohol," "Death from Alcohol," "Insanity from Alcohol," and at the close a brief sum-

mary of lessons. I believe that the argument of the book against alcohol has never been answered by even plausible objections, and that the tendency of opinion in the entire medical profession is strongly in favor of its scientific accuracy and truthfulness.

We cannot overestimate the power of the public school teachers on our country. If in all our schools the courses of study could be greatly simplified, more "individualism" exist in education, and personal and domestic hygiene taught, especially could such a subject as the one we are advocating receive its due attention, an immense intellectual and moral and social benefit would accrue. The evils arising from the ignorance of our population regarding the nature and influence of alcohol are widespread and countless, and our only hope of meeting and mitigating them is by the diffusion of sound knowledge through every agency that Christian philanthropy can devise or apply. If the children in our schools could be taught what alcohol *is*, the next generation would see a load lifted from our race the weight of which exceeds the powers of the imagination to conceive of. Such a work we hope to see done in this city, and we urge that it be begun at once.

THE TEMPERANCE LESSON BOOK.

A Series of Short Lessons on Alcohol and its Action on the Body.

By BENJAMIN W. RICHARDSON, M.A., M.D., F.R.S.,

Fellow of the Royal College of Physicians, London, etc.

16mo, 220 Pages. Price, 50 Cents.

PRICE REDUCED. PAPER EDITION. 25 CENTS.

THE NATIONAL TEMPERANCE SOCIETY has just published a new and very valuable work designed for all schools, public and private, and for home instruction, entitled THE TEMPERANCE LESSON BOOK, from the pen of Dr. B. W. Richardson, of London, the distinguished author of "The Cantor Lectures on Alcohol."

This timely and important book, which comprises a series of short lessons on alcohol and its action on the body, meets thoroughly a great educational need. It is the mature result of most careful and extended research on the part of its gifted author, whose attainments place him in the front rank of the ablest scientists of the world. There are fifty-two lessons, each followed by a series of questions for examination and review. They are free from labored and wearisome details, cover a wide range of physiological and hygienic information, and in style are simple and attractive, admirably adapted to win and retain to the end the interest of students. Their practical value, as a means of prevention and a safeguard for the young against the drink peril, it would be impossible to compute.

Measures should be immediately taken everywhere to bring the work to the notice of Boards of Education, School Committees, Trustees and Teachers, and to have it at once introduced into the schools under their direction and care. It should find a place in all schools, public and private, in every State and Territory, in every city, town, and school-district throughout the land. The following is the

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	Summary of Lessons

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BY EZRA M. HUNT, A.M., M.D.,

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