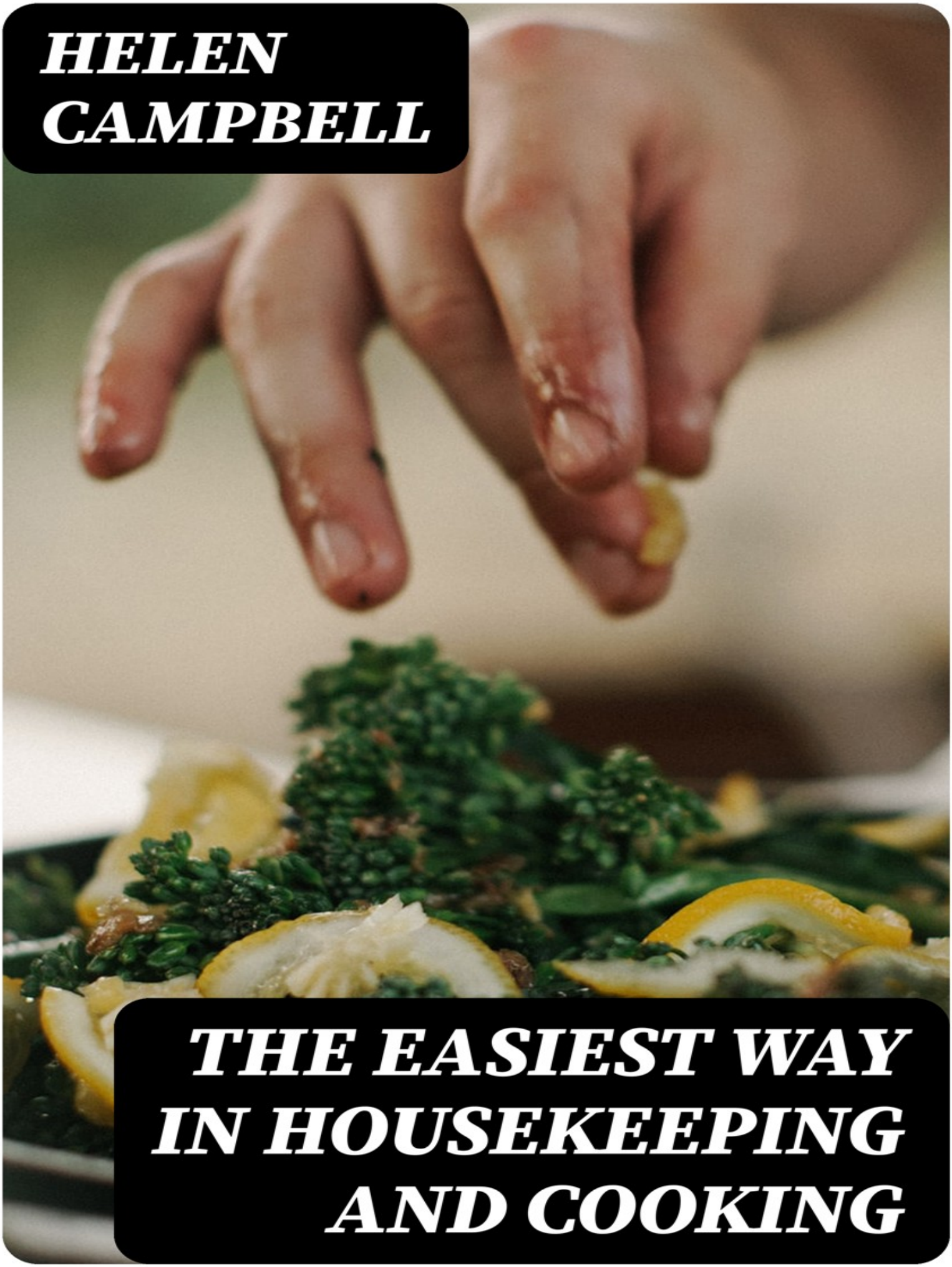
HELEN CAMPBELL
THE EASIEST WAY IN HOUSEKEEPING AND COOKING

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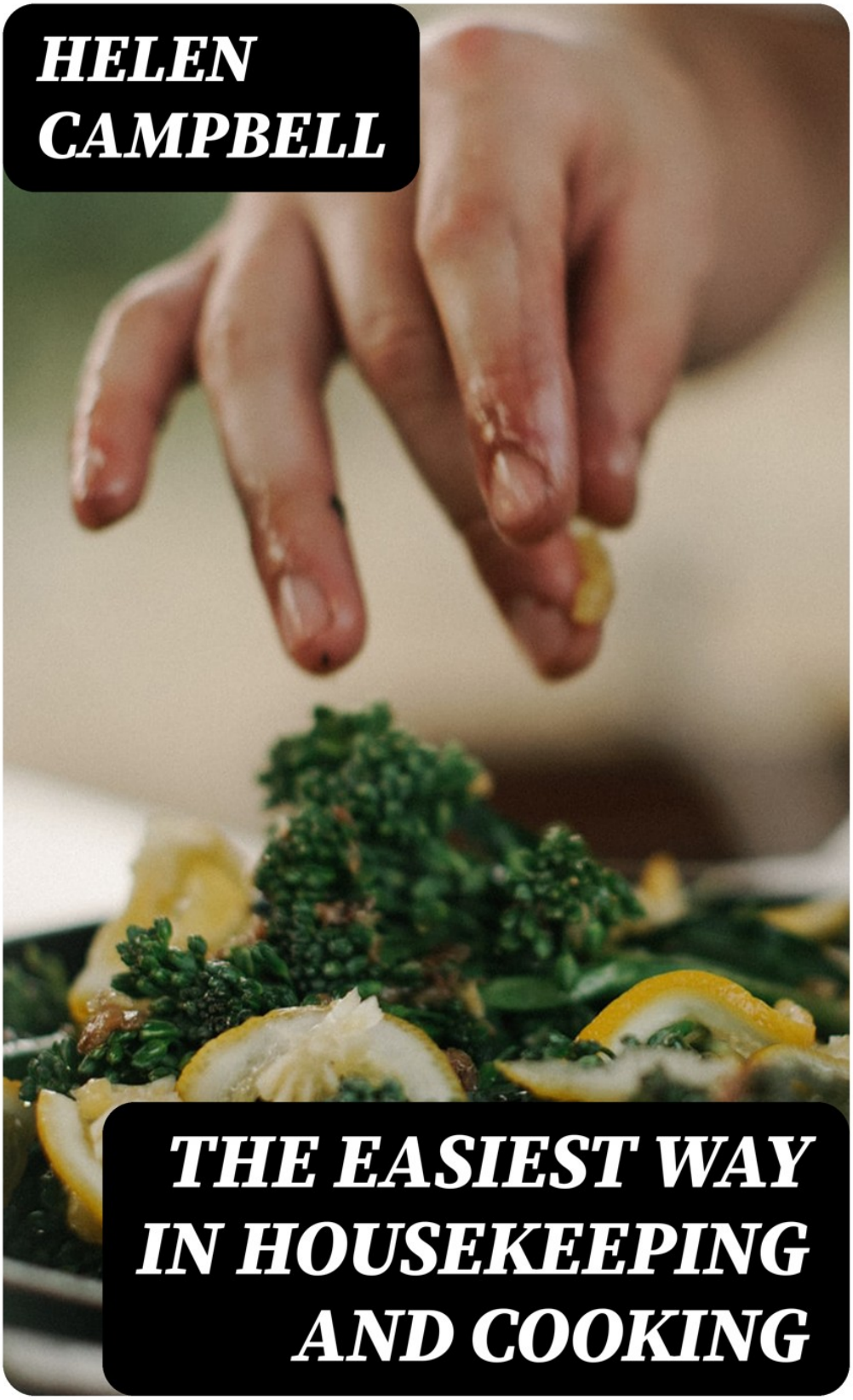

THE EASIEST WAY IN HOUSEKEEPING AND COOKING

Helen Campbell

The Easiest Way in Housekeeping and Cooking

Adapted to Domestic Use or Study in Classes

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Introductory.

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That room or toleration for another "cook-book" can exist in the public mind, will be denied at once, with all the vigor to be expected from a people overrun with cook-books, and only anxious to relegate the majority of them to their proper place as trunk-linings and kindling-material. The minority, admirable in plan and execution, and elaborate enough to serve all republican purposes, are surely sufficient for all the needs that have been or may be. With Mrs. Cornelius and Miss Parloa, Marion Harland and Mrs. Whitney, and innumerable other trustworthy authorities, for all every-day purposes, and Mrs. Henderson for such festivity as we may at times desire to make, another word is not only superfluous but absurd; in fact, an outrage on common sense, not for one instant to be justified.

Such was my own attitude and such my language hardly a year ago; yet that short space of time has shown me, that, whether the public admit the claim, or no, one more cook-book MUST BE. And this is why:—

A year of somewhat exceptional experience—that involved in building up several cooking-schools in a new locality, demanding the most thorough and minute system to assure their success and permanence—showed the inadequacies of any existing hand-books, and the necessities to be met in making a new one. Thus the present book has a twofold character, and represents, not only the ordinary receipt or cook book, usable in any part of the country and covering all ordinary household needs, but

covers the questions naturally arising in every lesson given, and ending in statements of the most necessary points in household science. There are large books designed to cover this ground, and excellent of their kind, but so cumbrous in form and execution as to daunt the average reader.

Miss Corson's "Cooking-School Text-Book" commended itself for its admirable plainness and fullness of detail, but was almost at once found impracticable as a system for my purposes; her dishes usually requiring the choicest that the best city market could afford, and taking for granted also a taste for French flavorings not yet common outside of our large cities, and to no great extent within them. To utilize to the best advantage the food-resources of whatever spot one might be in, to give information on a hundred points suggested by each lesson, yet having no place in the ordinary cook-book, in short, *to teach household science as well as cooking*, became my year's work; and it is that year's work which is incorporated in these pages. Beginning with Raleigh, N.C., and lessons given in a large school there, it included also a seven-months' course at the Deaf and Dumb Institute, and regular classes for ladies. Straight through, in those classes, it became my business to say, "This is no infallible system, warranted to give the whole art of cooking in twelve lessons. All I can do for you is to lay down clearly certain fixed principles; to show you how to economize thoroughly, yet get a better result than by the expenditure of perhaps much more material. Before our course ends, you will have had performed before you every essential operation in cooking, and will know, so far as I can make you know, prices, qualities, constituents, and

physiological effects of every type of food. Beyond this, the work lies in your own hands."

Armed with manuals,—American, English, French,—bent upon systematizing the subject, yet finding none entirely adequate, gradually, and in spite of all effort to the contrary, I found that my teaching rested more and more on my own personal experience as a housekeeper, both at the South and at the North. The mass of material in many books was found confusing and paralyzing, choice seeming impossible when a dozen methods were given. And for the large proportion of receipts, directions were so vague that only a trained housekeeper could be certain of the order of combination, or results when combined. So from the crowd of authorities was gradually eliminated a foundation for work; and on that foundation has risen a structure designed to serve two ends.

For the young housekeeper, beginning with little or no knowledge, but eager to do and know the right thing, not alone for kitchen but for the home as a whole, the list of topics touched upon in Part I. became essential. That much of the knowledge compressed there should have been gained at home, is at once admitted: but, unfortunately, few homes give it; and the aim has been to cover the ground concisely yet clearly and attractively. As to Part II., it does not profess to be the whole art of cooking, but merely the line of receipts most needed in the average family, North or South. Each receipt has been tested personally by the writer, often many times; and each one is given so minutely that failure is well-nigh impossible, if the directions are intelligently followed. A few distinctively Southern dishes are

included, but the ground covered has drawn from all sources; the series of excellent and elaborate manuals by well-known authors having contributed here and there, but the majority of rules being, as before said, the result of years of personal experiment, or drawn from old family receipt-books.

To facilitate the work of the teacher, however, a scheme of lessons is given at the end, covering all that can well be taught in the ordinary school year: each lesson is given with page references to the receipts employed, while a shorter and more compact course is outlined for the use of classes for ladies. A list of topics is also given for school use; it having been found to add greatly to the interest of the course to write each week the story of some ingredient in the lesson for the day, while a set of questions, to be used at periodical intervals, fixes details, and insures a certain knowledge of what progress has been made. The course covers the chemistry and physiology of food, as well as an outline of household science in general, and may serve as a text-book wherever such study is introduced. It is hoped that this presentation of the subject will lessen the labor necessary in this new field, though no text-book can fully take the place of personal enthusiastic work.

That training is imperatively demanded for rich and poor alike, is now unquestioned; but the mere taking a course of cooking-lessons alone does not meet the need in full. The present book aims to fill a place hitherto unoccupied; and precisely the line of work indicated there has been found the only practical method in a year's successful organization of schools at various points. Whether used at home with

growing girls, in cooking-clubs, in schools, or in private classes, it is hoped that the system outlined and the authorities referred to will stimulate interest, and open up a new field of work to many who have doubted if the food question had any interest beyond the day's need, and who have failed to see that nothing ministering to the best life and thought of this wonderful human body could ever by any chance be rightfully called "common or unclean." We are but on the threshold of the new science. If these pages make the way even a little plainer, the author will have accomplished her full purpose, and will know that in spite of appearances there is "room for one more."

HELEN CAMPBELL.

THE EASIEST WAY.

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CHAPTER I.

THE HOUSE: SITUATION AND ARRANGEMENT.

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From the beginning it must be understood that what is written here applies chiefly to country homes. The general principles laid down are applicable with equal force to town or city life; but as a people we dwell mostly in the country, and, even in villages or small towns, each house is likely to have its own portion of land about it, and to look toward all points of the compass, instead of being limited to two, as in city blocks. Of the comparative advantages or disadvantages of city or country life, there is no need to speak here. Our business is simply to give such details as may apply to both, but chiefly to the owners of moderate incomes, or salaried people, whose expenditure must always be somewhat limited. With the exterior of such homes, women at present have very little to do; and the interior also is thus far much in the hands of architects, who decide for general prettiness of effect, rather than for the most convenient arrangement of space. The young bride, planning a home, is resolved upon a bay-window, as large a parlor as possible, and an effective spare-room; but, having in most cases no personal knowledge of work, does not consider whether kitchen and dining-room are conveniently planned, or not, and whether the arrangement of pantries and closets is such that both rooms must be crossed a

hundred times a day, when a little foresight might have reduced the number certainly by one-half, perhaps more.

Inconvenience can, in most cases, be remedied; but unhealthfulness or unwholesomeness of location, very seldom: and therefore, in the beginning, I write that ignorance is small excuse for error, and that every one able to read at all, or use common-sense about any detail of life, is able to form a judgment of what is healthful or unhealthful. If no books are at hand, consult the best physician near, and have his verdict as to the character of the spot in which more or less of your life in this world will be spent, and which has the power to affect not only your mental and bodily health, but that of your children. Because your fathers and mothers have been neglectful of these considerations, is no reason why you should continue in ignorance; and the first duty in making a home is to consider earnestly and intelligently certain points.

Four essentials are to be thought of in the choice of any home; and their neglect, and the ignorance which is the foundation of this neglect, are the secret of not only the chronic ill-health supposed to be a necessity of the American organization, but of many of the epidemics and mysterious diseases classed under the head of "visitations of Providence."

These essentials are: a wholesome situation, good ventilation, good drainage, and a dry cellar. Rich or poor, high or low, if one of these be disregarded, the result will tell, either on your own health or on that of your family. Whether palace or hut, brown-stone front or simple wooden cottage, the law is the same. As a rule, the ordinary town or

village is built upon low land, because it is easier to obtain a water-supply from wells and springs. In such a case, even where the climate itself may be tolerably healthy, the drainage from the hills at hand, or the nearness of swamps and marshes produced by the same cause, makes a dry cellar an impossibility; and this shut-in and poisonous moisture makes malaria inevitable. The dwellers on low lands are the pill and patent-medicine takers; and no civilized country swallows the amount of tonics and bitters consumed by our own.

If possible, let the house be on a hill, or at least a rise of ground, to secure the thorough draining-away of all sewage and waste water. Even in a swampy and malarious country, such a location will insure all the health possible in such a region, if the other conditions mentioned are faithfully attended to.

Let the living-rooms and bedrooms, as far as may be, have full sunshine during a part of each day; and reserve the north side of the house for store-rooms, refrigerator, and the rooms seldom occupied. Do not allow trees to stand so near as to shut out air or sunlight; but see that, while near enough for beauty and for shade, they do not constantly shed moisture, and make twilight in your rooms even at mid-day. Sunshine is the enemy of disease, which thrives in darkness and shadow. Consumption or scrofulous disease is almost inevitable in the house shut in by trees, whose blinds are tightly closed lest some ray of sunshine fade the carpets; and over and over again it has been proved that the first conditions of health are, abundant supply of pure air, and free admission of sunlight to every nook and cranny.

Even with imperfect or improper food, these two allies are strong enough to carry the day for health; and, when the three work in harmony, the best life is at once assured.

If the house must be on the lowlands, seek a sandy or gravelly soil; and avoid those built over clay beds, or even where clay bottom is found under the sand or loam. In the last case, if drainage is understood, pipes may be so arranged as to secure against any standing water; but, unless this is done, the clammy moisture on walls, and the chill in every closed room, are sufficient indication that the conditions for disease are ripe or ripening. The only course in such case, after seeking proper drainage, is, first, abundant sunlight, and, second, open fires, which will act not only as drying agents, but as ventilators and purifiers. Aim to have at least one open fire in the house. It is not an extravagance, but an essential, and economy may better come in at some other place.

Having settled these points as far as possible,—the question of water-supply and ventilation being left to another chapter,—it is to be remembered that the house is not merely a place to be made pleasant for one's friends. They form only a small portion of the daily life; and the first consideration should be: Is it so planned that the necessary and inevitable work of the day can be accomplished with the least expenditure of force? North and South, the kitchen is often the least-considered room of the house; and, so long as the necessary meals are served up, the difficulties that may have hedged about such serving are never counted. At the South it is doubly so, and necessarily; old conditions having made much consideration of convenience for

servants an unthought-of thing. With a throng of unemployed women and children, the question could only be, how to secure some small portion of work for each one; and in such case, the greater the inconveniences, the more chance for such employment. Water could well be half a mile distant, when a dozen little darkies had nothing to do but form a running line between house and spring; and so with wood and kindling and all household necessities.

To-day, with the old service done away with once for all, and with a set of new conditions governing every form of work, the Southern woman faces difficulties to which her Northern or Western sister is an utter stranger; faces them often with a patience and dignity beyond all praise, but still with a hopelessness of better things, the necessary fruit of ignorance. Old things are passed away, and the new order is yet too unfamiliar for rules to have formulated and settled in any routine of action. While there is, at the North, more intuitive and inherited sense of how things should be done, there is on many points an almost equal ignorance, more especially among the cultivated classes, who, more than at any period of woman's history, are at the mercy of their servants. Every science is learned but domestic science. The schools ignore it; and, indeed, in the rush toward an early graduation, there is small room for it.

"She can learn at home," say the mothers. "She will take to it when her time comes, just as a duck takes to water," add the fathers; and the matter is thus dismissed as settled.

In the mean time the "she" referred to—the average daughter of average parents in both city and country—neither "learns at home," nor "takes to it naturally," save in

exceptional cases; and the reason for this is found in the love, which, like much of the love given, is really only a higher form of selfishness. The busy mother of a family, who has fought her own way to fairly successful administration, longs to spare her daughters the petty cares, the anxious planning, that have helped to eat out her own youth; and so the young girl enters married life with a vague sense of the dinners that must be, and a general belief that somehow or other they come of themselves. And so with all household labor. That to perform it successfully and skillfully, demands not only training, but the best powers one can bring to bear upon its accomplishment, seldom enters the mind; and the student, who has ended her course of chemistry or physiology enthusiastically, never dreams of applying either to every-day life.

This may seem a digression; and yet, in the very outset, it is necessary to place this work upon the right footing, and to impress with all possible earnestness the fact, that Household Science holds every other science in tribute, and that only that home which starts with this admission and builds upon the best foundation the best that thought can furnish, has any right to the name of "home." The swarms of drunkards, of idiots, of insane, of deaf and dumb, owe their existence to an ignorance of the laws of right living, which is simply criminal, and for which we must be judged; and no word can be too earnest, which opens the young girl's eyes to the fact that in her hands lie not alone her own or her husband's future, but the future of the nation. It is hard to see beyond one's own circle; but if light is sought for, and there is steady resolve and patient effort to do the best for

one's individual self, and those nearest one, it will be found that the shadow passes, and that progress is an appreciable thing.

Begin in your own home. Study to make it not only beautiful, but perfectly appointed. If your own hands must do the work, learn every method of economizing time and strength. If you have servants, whether one or more, let the same laws rule. It is not easy, I admit; no good thing is: but there is infinite reward for every effort. Let no failure discourage, but let each one be only a fresh round in the ladder all must climb who would do worthy work; and be sure that the end will reward all pain, all self-sacrifice, and make you truly the mistresses of the home for which every woman naturally and rightfully hopes, but which is never truly hers till every shade of detail in its administration has been mastered.

The house, then, is the first element of home to be considered and studied; and we have settled certain points as to location and arrangement. This is no hand-book of plans for houses, that ground being thoroughly covered in various books,—the titles of two or three of which are given in a list of reference-books at the end. But, whether you build or buy, see to it that your kitchens and working-rooms are well lighted, well aired, and of good size, and that in the arrangement of the kitchen especially, the utmost convenience becomes the chief end. Let sink, pantries, stove or range, and working-space for all operations in cooking, be close at hand. The difference between a pantry at the opposite end of the room, and one opening close to the sink, for instance, may seem a small matter; but when it

comes to walking across the room with every dish that is washed, the steps soon count up as miles, and in making even a loaf of bread, the time and strength expended in gathering materials together would go far toward the thorough kneading, which, when added to the previous exertion, makes the whole operation, which might have been only a pleasure, a burden and an annoyance.

Let, then, stove, fuel, water, work-table, and pantries be at the same end of the kitchen, and within a few steps of one another, and it will be found that while the general labor of each day must always be the same, the time required for its accomplishment will be far less, under these favorable conditions. The successful workman,—the type-setter, the cabinet-maker, or carpenter,—whose art lies in the rapid combination of materials, arranges his materials and tools so as to be used with the fewest possible movements; and the difference between a skilled and unskilled workman is not so much the rate of speed in movement, as in the ability to make each motion tell. The kitchen is the housekeeper's workshop; and, in the chapter on *House-work*, some further details as to methods and arrangements will be given.

CHAPTER II.

THE HOUSE: VENTILATION.

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Having settled the four requisites in any home, and suggested the points to be made in regard to the first one,—that of wholesome situation,—*Ventilation* is next in order. Theoretically, each one of us who has studied either natural philosophy or physiology will state at once, with more or less glibness, the facts as to the atmosphere, its qualities, and the amount of air needed by each individual; practically nullifying such statement by going to bed in a room with closed windows and doors, or sitting calmly in church or public hall, breathing over and over again the air ejected from the lungs all about,—practice as cleanly and wholesome as partaking of food chewed over and over by an indiscriminate crowd.

Now, as to find the Reason Why of all statements and operations is our first consideration, the familiar ground must be traversed again, and the properties and constituents of air find place here. It is an old story, and, like other old stories accepted by the multitude, has become almost of no effect; passive acceptance mentally, absolute rejection physically, seeming to be the portion of much of the gospel of health. "Cleanliness is next to godliness," is almost an axiom. I am disposed to amend it, and assert that cleanliness *is* godliness, or a form of godliness. At any rate, the man or woman who demands cleanliness without and within, this cleanliness meaning pure air, pure water, pure

food, must of necessity have a stronger body and therefore a clearer mind (both being nearer what God meant for body and mind) than the one who has cared little for law, and so lived oblivious to the consequences of breaking it.

Ventilation, seemingly the simplest and easiest of things to be accomplished, has thus far apparently defied architects and engineers. Congress has spent a million in trying to give fresh air to the Senate and Representative Chambers, and will probably spend another before that is accomplished. In capitols, churches, and public halls of every sort, the same story holds. Women faint, men in courts of justice fall in apoplectic fits, or become victims of new and mysterious diseases, simply from the want of pure air. A constant slow murder goes on in nurseries and schoolrooms; and white-faced, nerveless children grow into white-faced and nerveless men and women, as the price of this violated law.

What is this air, seemingly so hard to secure, so hard to hold as part of our daily life, without which we can not live, and which we yet contentedly poison nine times out of ten?

Oxygen, nitrogen, carbonic acid, and watery vapor; the last two being a small portion of the bulk, oxygen and nitrogen making up four-fifths. Small as the proportion of oxygen seems, an increase of but one-fifth more would be destruction. It is the life-giver, but undiluted would be the life-destroyer; and the three-fifths of nitrogen act as its diluent. No other element possesses the same power. Fires and light-giving combustion could not exist an instant without oxygen. Its office seems that of universal destruction. By its action decay begins in meat or

vegetables and fruits; and it is for this reason, that, to preserve them, all oxygen must be driven out by bringing them to the boiling point, and sealing them up in jars to which no air can find entrance. With only undiluted oxygen to breathe, the tissues would dry and shrivel, fuel burn with a fury none could withstand, and every operation of nature be conducted with such energy as soon to exhaust and destroy all power. But "a mixture of the fiery oxygen and inert nitrogen gives us the golden mean. The oxygen now quietly burns the fuel in our stoves, and keeps us warm; combines with the oil in our lamps, and gives us light; corrodes our bodies, and gives us strength; cleanses the air, and keeps it fresh and invigorating; sweetens foul water, and makes it wholesome; works all around us and within us a constant miracle, yet with such delicacy and quietness, we never perceive or think of it, until we see it with the eye of science."

Food and air are the two means by which bodies live. In the full-grown man, whose weight will average about one hundred and fifty-four pounds, one hundred and eleven pounds is oxygen drawn from the air we breathe. Only when food has been dissolved in the stomach, absorbed at last into the blood, and by means of circulation brought into contact with the oxygen of the air taken into our lungs, can it begin to really feed and nourish the body; so that the lungs may, after all, be regarded as the true stomach, the other being not much more than the food-receptacle.

Take these lungs, made up within of branching tubes, these in turn formed by myriads of air-cells, and each air-cell owning its network of minute cells called *capillaries*. To

every air-cell is given a blood-vessel bringing blood from the heart, which finds its way through every capillary till it reaches another blood-vessel that carries it back to the heart. It leaves the heart charged with carbonic acid and watery vapor. It returns, if pure air has met it in the lung, with all corruption destroyed, a dancing particle of life. But to be life, and not slow death, thirty-three hogsheads of air must pass daily into the lungs, and twenty-eight pounds of blood journey from heart to lungs and back again three times in each hour. It rests wholly with ourselves, whether this wonderful tide, ebbing and flowing with every breath, shall exchange its poisonous and clogging carbonic acid and watery vapor for life-giving oxygen, or retain it to weigh down and debilitate every nerve in the body.

With every thought and feeling some actual particles of brain and nerve are dissolved, and sent floating on this crimson current. With every motion of a muscle, whether great or small, with every process that can take place in the body, this ceaseless change of particles is going on. Wherever oxygen finds admission, its union with carbon to form carbonic acid, or with hydrogen to form water, produces heat. The waste of the body is literally burned up by the oxygen; and it is this burning which means the warmth of a living body, its absence giving the stony cold of the dead. "Who shall deliver me from the body of this death?" may well be the literal question for each day of our lives; and "pure air" alone can secure genuine life. Breathing bad air reduces all the processes of the body, lessens vitality; and thus, one in poor health will suffer more from bad air than those who have become thoroughly

accustomed to it. If weakened vitality were the only result, it would not be so serious a matter; but scrofula is soon fixed upon such constitutions, beginning with its milder form as in consumption, but ending in the absolute rottenness of bone and tissue. The invalid may live in the healthiest climate, pass hours each day in the open air, and yet undo or neutralize much of the good of this by sleeping in an unventilated room at night. Diseased joints, horrible affections of the eye or ear or skin, are inevitable. The greatest living authorities on lung-diseases pronounce deficient ventilation the chief cause of consumption, and more fatal *than all other causes put together*; and, even where food and clothing are both unwholesome, free air has been found able to counteract their effect.

In the country the balance ordained in nature has its compensating power. The poisonous carbonic acid thrown off by lungs and body is absorbed by vegetation whose food it is, and which in every waving leaf or blade of grass returns to us the oxygen we demand. Shut in a close room all day, or even in a tolerably ventilated one, there may be no sense of closeness; but go to the open air for a moment, and, if the nose has not been hopelessly ruined by want of education, it will tell unerringly the degree of oxygen wanting and required.

It is ordinarily supposed that carbonic-acid gas, being heavier, sinks to the bottom of the room, and that thus trundle-beds, for instance, are especially unwholesome. This would be so, were the gas pure. As a matter of fact, however, being warmed in the body, and thus made lighter, it rises into the common air, so that usually more will be

found at the top than at the bottom of a room. This gas is, however, not the sole cause of disease. From both lungs and skin, matter is constantly thrown off, and floats in the form of germs in all impure air. To a person who by long confinement to close rooms has become so sensitive that any sudden current of air gives a cold, ventilation seems an impossibility and a cruelty; and the problem becomes: How to admit pure air throughout the house, and yet avoid currents and draughts. "Night-air" is even more dreaded than the confined air of rooms; yet, as the only air to be had at night must come under this head, it is safer to breathe that than to settle upon carbonic acid as lung-food for a third, at least, of the twenty-four hours. As fires feed on oxygen, it follows that every lamp, every gas-jet, every furnace, are so many appetites satisfying themselves upon our store of food, and that, if they are burning about us, a double amount of oxygen must be furnished.

The only mode of ventilation that will work always and without fail is that of a warm-air flue, the upward heated air-current of which draws off the foul gases from the room: this, supplemented by an opening on the opposite side of the room for the admission of pure air, will accomplish the desired end. An open fire-place will secure this, provided the flue is kept warm by heat from the kitchen fire, or some other during seasons when the fire-place is not used. But perhaps the simplest way is to have ample openings (from eight to twelve inches square) at the top and bottom of each room, opening into the chimney-flue: then, even if a stove is used, the flue can be kept heated by the extension of the stove-pipe some distance up within the chimney, and

the ascending current of hot air will draw the foul air from the room into the flue. This, as before stated, must be completed by a fresh-air opening into the room on another side: if no other can be had, the top of the window may be lowered a little. The stove-pipe *extension* within the chimney would better be of cast-iron, as more durable than the sheet-iron. When no fire is used in the sleeping-rooms, the chimney-flue must be heated by pipes from the kitchen or other fires; and, with the provision for *fresh* air never forgotten, this simple device will invariably secure pure and well-oxygenated air for breathing. "Fussy and expensive," may be the comment; but the expense is less than the average yearly doctor's bill, and the fussiness nothing that your own hands must engage in. Only let heads take it in, and see to it that no neglect is allowed. In a southern climate doors and windows are of necessity open more constantly; but at night they are closed from the fear referred to, that night-air holds some subtle poison. It is merely colder, and perhaps moister, than day-air; and an extra bed-covering neutralizes this danger. Once accustomed to sleeping with open windows, you will find that taking cold is impossible.

If custom, or great delicacy of organization, makes unusual sensitiveness to cold, have a board the precise width of the window, and five or six inches high. Then raise the lower sash, putting this under it; and an upward current of air will be created, which will in great part purify the room.

Beyond every thing, watch that no causes producing foul air are allowed to exist for a moment. A vase of neglected

flowers will poison the air of a whole room. In the area or cellar, a decaying head of cabbage, a basket of refuse vegetables, a forgotten barrel of pork or beef brine, a neglected garbage pail or box, are all premiums upon disease. Let air and sunlight search every corner of the house. Insist upon as nearly spotless *cleanliness* as may be, and the second prime necessity of the home is secure.

When, as it is written, man was formed from the dust of the earth, the Lord God "breathed into his nostrils the breath of life; and man became a *living soul*."

Shut off that breath of life, or poison it as it is daily poisoned, and not only body, but soul, dies. The child, fresh from its long day out of doors, goes to bed quiet, content, and happy. It wakes up a little demon, bristling with crossness, and determined not to "be good." The breath of life carefully shut out, death has begun its work, and you are responsible. And the same criminal blunder causes not only the child's suffering, but also the weakness which makes many a delicate woman complain that it "takes till noon to get her strength up."

Open the windows. Take the portion to which you were born, and life will grow easier.

CHAPTER III.

DRAINAGE AND WATER-SUPPLY.

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Air and sunshine having been assured for all parts of the house in daily use, the next question must be an unfailing and full supply of pure water. "Dig a well, or build near a spring," say the builders; and the well is dug, or the spring tapped, under the general supposition that water is clean and pure, simply because it is water, while the surroundings of either spring or well are unnoticed. Drainage is so comparatively new a question, that only the most enlightened portions of the country consider its bearings; and the large majority of people all over the land not only do not know the interests involved in it, but would resent as a personal slight any hint that their own water-supply might be affected by deficient drainage.

Pure water is simply oxygen and hydrogen, eight-ninths being oxygen and but one-ninth hydrogen; the latter gas, if pure, having, like oxygen, neither taste nor smell. Rain-water is the purest type; and, if collected in open vessels as it falls, is necessarily free from any possible taint (except at the very first of a rain, when it washes down considerable floating impurity from the atmosphere, especially in cities). This mode being for obvious reasons impracticable, cisterns are made, and rain conducted to them through pipes leading from the roof. The water has thus taken up all the dust, soot, and other impurities found upon the roof, and, unless filtered, can not be considered desirable drink. The

best cistern will include a filter of some sort, and this is accomplished in two ways. Either the cistern is divided into two parts, the water being received on one side, and allowed to slowly filter through a wall of porous brick, regarded by many as an amply sufficient means of purification; or a more elaborate form is used, the division in such case being into upper and under compartments, the upper one containing the usual filter of iron, charcoal, sponge, and gravel or sand. If this water has a free current of air passing over it, it will acquire more sparkle and character; but as a rule it is flat and unpleasant in flavor, being entirely destitute of the earthy salts and the carbonic-acid gas to be found in the best river or spring water.

Distilled water comes next in purity, and is, in fact, identical in character with rain-water; the latter being merely steam, condensed into rain in the great alembic of the sky. But both have the curious property of taking up and dissolving *lead* wherever they find it; and it is for this reason that lead pipes as leaders from or to cisterns should *never* be allowed, unless lined with some other metal.

The most refreshing as well as most wholesome water is river or spring water, perfectly filtered so that no possible impurity can remain. It is then soft and clear; has sufficient air and carbonic acid to make it refreshing, and enough earthy salts to prevent its taking up lead, and so becoming poisonous. River-water for daily use of course requires a system of pipes, and in small places is practically unavailable; so that wells are likely, in such case, to be the chief source of supply. Such water will of course be spring-water, with the characteristics of the soil through which it

rises. If the well be shallow, and fed by surface springs, all impurities of the soil will be found in it; and thus to *dig deep* becomes essential, for many reasons. Dr. Parker of England, in some papers on practical hygiene, gives a clear and easily understood statement of some causes affecting the purity of well-water.

"A well drains an extent of ground around it, in the shape of an inverted cone, which is in proportion to its own depth and the looseness of the soil. In very loose soils a well of sixty or eighty feet will drain a large area, perhaps as much as two hundred feet in diameter, or even more; but the exact amount is not, as far as I know, precisely determined.

"Certain trades pour their refuse water into rivers, gas-works; slaughter-houses; tripe-houses; size, horn, and isinglass manufactories; wash-houses, starch-works, and calico-printers, and many others. In houses it is astonishing how many instances occur of the water of butts, cisterns, and tanks, getting contaminated by leaking of pipes and other causes, such as the passage of sewer-gas through overflow-pipes, &c.

"As there is now no doubt that typhoid-fever, cholera, and dysentery may be caused by water rendered impure by the evacuations passed in those diseases, and as simple diarrhoea seems also to be largely caused by animal organic [matter in] suspension or solution, it is evident how necessary it is to be quick-sighted in regard to the possible impurity of water from incidental causes of this kind. Therefore all tanks and cisterns should be inspected regularly, and any accidental source of impurity must be looked out for. Wells should be covered; a good coping put