A Gigantic Flour Mill in California.

The competition of India and Russia in the western European wheat markets is causing the merchants of California to use every effort to maintain their footing, and among other devices, says *Engineering*, for lessening the cost of transport there is arising the practice of reducing the grain to flour before it is shipped, thereby effecting a saving of 20 per cent in freight. This carries with it the additional advantage of employing a large amount of local labor, and of turning the wheat to the best advantage, as by aid of new machinery and the best systems of milling a far greater and better yield can be obtained than by the more antiquated methods which still to a great extent prevail here. Messrs. Starr & Co. are now building an immense flour mill and wheat elevator on the south shore of the Straits of Carquinez, about two miles below Porta Costa, and fronting the town of Crockett, to carry out this plan, the spot they have chosen being available for the largest ocean steamships, while it is sufficiently sheltered for the river barges from the interior to approach it with safety.

At the site of the mill the shore curves inward, leaving a flat rock reef mostly bare at low water, but sloping off abruptly on the northern and western edges. Upon this reef there is being erected an eight story mill and elevator building, about 150 feet by 300 feet, reared upon a superstructure of artificial stone piers and arches. The piers, of which there will be 209, averaging from 5 feet to 8 feet square at the base, and standing 13 feet apart from center to center, are built upon the rock, and are connected by groined arches, standing some 4 feet clear above high water level, which has an open passage under them, between the piers. The artificial stone floor of the mill and elevator is laid over the arches and forms a monolithic platform of nearly 50,000 square feet area. There will be 140,000 cubic feet in the piers, arches, and floors, the greater part being already in position, and heavy wire cables are being laid transversely through and through the concrete above the arches to serve as earthquake ties. This portion of the work, which will cost $50,000, is being done by Mr. Ernest L. Ransome, who has long been occupied in California, bringing into extensive and successful use the artificial stone invented by his father, Mr. Frederick Ransome, a number of years ago.

The mill building will be 143 feet by 158 feet, with seven stories, aggregating 100 feet in height, while the elevator, 82 feet by 178 feet, is to be capable of storing 10,000 tons of wheat. The outside walls of the great building will be formed of heavy buttresses, rising over the artificial stone piers, and connected with curtain walls. The floors above the first story will be carried by clusters of five wooden pillars, 13 feet apart. The engines and boilers are in a separate structure, the power provided for milling purposes being 2,400 horse power, and for the elevator 300 horse power. The ultimate capacity of the mill will be 6,000 barrels of flour per day, but it will be started with machinery for turning out 2,500 barrels per day. Agents of the company are now in Europe inspecting all the best milling machinery and processes.

The docks, to be covered by two-story warehouses, are in two sections, having an open slip 104 feet in width between them. The eastern dock section will have an area of 115,000 square feet, and the western section one of 256,800 square feet, and both are to be traversed by railway lines in connection with the railroad system of the State.

From this account an idea will be gained of the extent of the enterprise which Messrs. Starr & Co. are inaugurating, and the magnitude of the trade in which they are engaged, and which they are making such great exertions to keep.

The New Time Standards.

The proposed new standards of time for the railways of the country, which are to be established by the General Time Convention of Railroad Managers, has received the approval of the Harvard Observatory, and its co-operation is promised. The railroads centering here acquiesced in the plan on the condition that the time given from the observatory should be correspondingly changed. The consent of Professor E. C. Pickering, the director of the observatory, being necessary, he was met in New York promptly on his arrival from Europe on Sunday by Mr. J. Rayner Edmonds, of the observatory, and his hearty approval of the scheme was readily given. Accordingly, a note has been sent to the Secretary of the Chicago Convention, W. F. Allen, to this effect, and assurance given that if the convention adopts the system the observatory will be ready to furnish telegraphic signals conforming to the minute and second of the proposed standards.

Under the new system, instead of running the various systems and divisions of systems by as many local standards of time, the continent is to be divided into five broad belts, running north and south, the time for each of which will be one hour slower than that of the next division to the eastward and one hour faster than that of the next division to the westward. By this plan the minute hand of a traveler's watch will not have to be changed, however far he may have to travel or in what direction; but his watch will be just one hour slow when he crosses the imaginary line into the next division to the east, or an hour fast when he crosses the line into the next division to the west. The time now furnished by the Harvard Observatory is the mean solar time for the Boston State House. The new time will be 15 minutes 44·5 seconds—practically 15¾ minutes—slower, and will be the average time for this division, which includes the New England States, New York and Pennsylvania, and the greater part of Canada. North of Lake Erie the division extends west to Detroit, while south of Lake Erie Pittsburg is practically on the western boundary of this division. Thus in the region north of the lake the standard time will be five hours slow by Greenwich, and south of Lake Erie and west of Pittsburg it will be six hours slow by Greenwich. The new standard, if adopted, will go into effect on a Sunday noon, and from that hour all the railroads will be run by the new time.

The new time standard was adopted October 11, by 78,000 miles of railway.

IMPROVED TRICYCLE.

The guide wheel standard passes through a sleeve, and has at its upper end a short right angle bar, to the end of which is a rod reaching to the crank operated by the right hand piece. The tricycle is propelled by the feet of the rider working upon jointed pitmen, whose forward ends are pivoted to the ends of a crossbar, and whose rear ends are attached to the crank of the bent axle. The body iron is U-shaped, and is formed with sets of plates by which it is

ASBURY'S IMPROVED TRICYCLE.

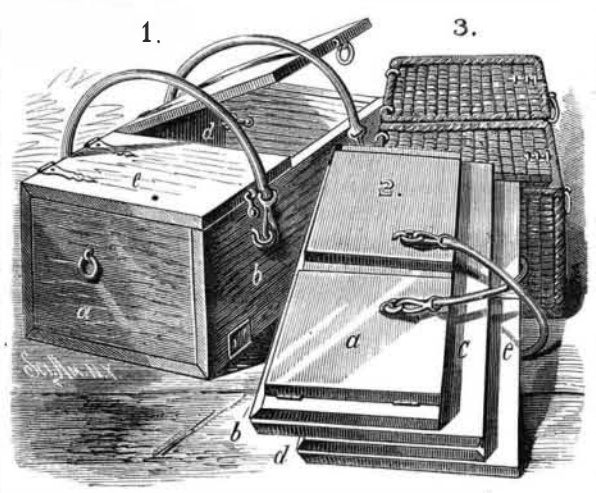
secured to the axle, the plates serving as boxes to receive the journaled blocks. To the upper ends of the body iron is secured, in a horizontal position, a second U-shaped iron, in the center of which is a third U-shaped iron vertically arranged for supporting the seat. To the forward ends of the horizontal piece are attached the hand pieces, one of which is rigid while the other may be turned, and so change the front wheel from left to right to guide the tricycle.

This invention has been patented by Mr. William Asbury, of Boston, Mass.

FOLDING BASKET.

This basket may be folded very rapidly, so as to occupy but little space, and can be erected readily for use. It may be made of either sheet metal, wood, wicker-work, or other material specially adapted for the service to which it is to be put. In the accompanying engravings, Fig. 1 represents the erected basket made of wood, Fig. 2 the same folded, and Fig. 3 shows it erected and made of wicker-work. In the first two figures like letters represent like parts. To the opposite edges of the bottom the front and back are hinged; the front being hinged so that it swings out and folds under the bottom, while the back is hinged upon the inside so that it will rest upon the bottom. The cover, which is halved, is hinged so that it folds over upon the outer surface of the back. The ends are hinged to the front side and fold down upon its inner surface.

From this it will be seen that all the parts of the basket lie flat upon each other, and take but little room. The covers are provided with hasps or loops through which hooks on the front can be passed. The sides of the ends opposite the hinges are furnished with hooks to be passed through



DAUL'S FOLDING BASKET.

eyes or rings projecting from the inner surface of the back, so as to keep these parts in place. On the inner lower edge of the ends is a sliding bolt, which enters a hole in the bottom. On the outer part of the front and back and at a short distance from the top are staples or rings, and on the two ends and under side of the cover are similar staples. When the basket is erected the handles are hooked to the back and front staples, and when folded are hooked to the end and cover staples. The basket may be made strong and light, and at small cost.

The invention has been patented by Mr. Anton Daul, of Jamaica, Long Island, N. Y.

Labor Saving Cranes.

At a recent meeting of the American Society of Civil Engineers, in this city, a paper by Mr. C. J. Appleby, on the subject of cranes as labor saving machines, was read by the author, who remarked that a well constructed crane or other similar power machine requiring only one man to drive it would do as much work as could be done by the manual power of ten men, but in one-tenth of the time they would require. It seems singular that railroad and waterside depots and workshops should so rarely be laid out with reference to the employment of such labor saving machines. The most economical working result is obtained from machines so arranged that when they take hold of the load, it is not released until final deposit. The author considered the following systems for transmitting or applying power:

1. The well known hydraulic system, with pressure pumps, accumulator, and distributing pipes.
2. Compressed air distributed through pipes.
3. Steam distributed as above.
4. High speed rope or "endless cotton cord," which runs at a speed of 5,000 to 6,000 feet per minute.
5. Low speed rope running 1,500 to 2,000 feet per minute.
6. Square shaft supported on tumbler bearings.
7. Steam from a boiler delivered on the top of a piston with multiplying chains similar to the hydraulic system.
8. Boiler and engine fixed on the crane, and driving gear for the several motions required.

The first, second, and third can only be applied to cranes fixed or moving over very limited areas. The fourth, fifth, and sixth will transmit power over large areas, which, however, should be nearly rectangular. The other two can be used generally wherever there is a railway track. The hydraulic system possesses great advantages over compressed air or steam, but experience tends to the conclusion that its common use will be attended with considerable inconvenience where the winters are cold. The use of compressed air has not been applied with great success in many cases.

Steam is largely used, and frequently carried through 1,000 feet of pipe without much inconvenience. The high speed cotton cord runs at a speed of 5,000 to 6,000 feet per minute. The cord works in grooved pulleys, is carried on rollers or other supports at intervals of ten to twenty-five feet, and is kept in tension by a weighted pulley. Low speed rope transmission is generally effected by a hemp rope running from 1,500 to 2,000 feet per minute. The square shaft has been used for many years, the only special difficulty experienced being that of supporting the long main line of driving shaft. The author exhibited recent designs whereby this difficulty has been very successfully overcome. The relative advantage of rope or shaft transmission is largely influenced by local circumstances. As a general rule the rope system costs less and is better where the distance for transmitting exceeds 200 feet. Below that distance the shaft is probably the best and cheapest. But the rope possesses advantages when machinery has to be on different levels, or at an angle with the point from which the power is transmitted.

The steam crane, employed under many differing conditions, perhaps performs more functions than any other mechanical arrangement for lifting and placing loads. All such cranes should lift and turn around by steam power. One, specially illustrated, has additional motions for altering the radius of the jib for hauling materials, so as to bring them within the reach of the machine, and also for moving empty or loaded cars. Fixed cranes are often seen so placed that one-third or even one-half of the number erected at a particular point are idle. It would, therefore, seem that for the same outlay, the best duty will be obtained from movable cranes. Where two or more railroad tracks are parallel with the water front, it will often be desirable to make the crane span the two lines of tracks, allowing head room for the vehicles to pass under it. Cranes fixed on floating vessels were also illustrated up to 60 tons power. Locomotive cranes up to 25 tons were described, and also cranes specially adapted to terminal freight stations. One of these has lifted 80 tons per hour a height of 20 to 30 feet, and deposited the loads of 1½ to 2 tons each 60 feet from the point where taken up. A similar crane commonly delivers 240 barrels of oil per hour the same height of lift and length of deposit.

The cost, per day, is one driver's wages and the necessary fuel, oil, etc. Five per cent. per annum is ample allowance for depreciation. The cost of this system of working is easily ascertained, but a great gain also arises from the increased speed of passing large quantities of merchandise.

The paper was discussed by Messrs. Cartwright, Cooper, Emery, Farney, Geo. S. Greene, Jr., Hamilton, R. L. Harris, James Platt, and the author.

A Shower of Grasshoppers.

According to a local paper, a shower of grasshoppers fell in Louisville during the evening of September 30. They made their appearance about nine o'clock, and soon scattered over the streets, filling every place to which they could gain access. Many gathered about the lights, but the cold had so benumbed them that they displayed little activity. They were of all sizes, but the large ones outnumbered the little ones. It is supposed they were blown to the city by a strong breeze which prevailed during the afternoon, but that theory will hardly account for their great numbers, for they were thicker than is generally the case on their native heath.

Mistakes in Nursing.

A physician contributes to *Chambers's Journal* a paperon the nursing of the sick, from which we extract the most practical portion of the M.D.'s suggestions. It will be observed that the writer dwells upon the importance of avoiding over-attention on the part of the attendant in the sick room, and the importance of quietude, which he defines as the absence of all excitement, and it must be remembered, the writer further adds, that anything out of the common will tend to excite the mind of a sufferer. Do not, therefore, walk on tiptoe, for this, in addition to its unusual elaboration of the gait, invariably causes a certain amount of creaking. Speak in low tones, but don't whisper; a whisper will often awaken a sleeper who would not be disturbed by ordinary conversation; and never say "Hush!" Let your clothes and foot covering be of as noiseless and unobtrusive a character as possible, and instead of gliding and tottering about like a rickety ghost, do not hesitate to walk. If you have occasion to say anything in the room, say it so that the patient can hear it if he wishes, and do not let him be aware of your conspiring privately with the others, especially at the door.

That door has much to answer for. If it be visible from the bed, people open it cautiously, put their heads in, and slowly withdraw again. If, as is more frequently the case, it is screened by the bed curtains, mysterious openings and shuttings are heard, unattended with any ingress or egress, and *sotto voce* colloquies go on outside. When you enter, do so honestly and at once; do not spend five minutes in turning the handle, like a housebreaker, thereby producing a series of irritating little clicks, finally terminating in a big snap, with which the door flies open. If the latch be at all rusty, a handle that is slowly wound back in this way will often stick, and either require to be rattled back into position, or, if left as it is, may start back suddenly after a time of its own accord with a report like a pistol shot. It is always well to recollect that it by no means follows that a sick person is asleep because his eyes are shut; he may be acutely conscious of all that is passing in the room, though unable or unwilling to make any sign; and nothing can be more maddening, under such circumstances, than to have people hush-sh-ing, and whispering around, and creaking about on the tips of their toes. We have all sympathized in our hearts with poor Sir Leicester Dedlock when his tongue was smitten with paralysis, with his sister constantly bending over him with clasped hands and murmuring, "He is asleep!" till, goaded to desperation, he makes signs for his slate and writes, "I am not."

Never stand at the foot of the bed and look at the patient. While talking to him it is better to sit by the side of the bed, and as near the pillow as possible, so that you may converse easily, while your face and body are turned in the same direction as his. By this means, you can make all necessary observation of his features without enforcing the arrest of his eyes to your own, which is so embarrassing and disagreeable to one lying in bed, and is almost unavoidable when facing him Keep him in as comfortable a position as possible, by all means, but don't be too demonstrative in smoothing the pillows and little offices of that sort. Fidgety attentions will worry him, and do him more harm than downright neglect.

When you are sleepy, it is better for your charge, as well as for yourself, that you should go to bed at once, and get that repose in slumber to which you *must* succumb eventually, however strong your devotion may be, and however great the interests at stake. It is not necessary to dwell here on the prudence of economizing your strength, that you may be capable of greater or prolonged exertions, should the need for them arise, or to look at this detail from the point of view which affects yourself. But in any case, you can be of little or no service, worn out with fatigue, and in a condition more akin to somnambulism than vigilance, and the spectacle of a nodding, dozing nurse is neither soothing nor reassuring to the sufferer; while, if you be one near and dear to him, he will be tormented with anxiety lest you should impair your own health on his account. In such a case as this, you cannot do better than lie down comfortably on a sofa or bed where he can watch you, and there have a good nap—for his sake.

Some people have a great notion of "tempting the appetite" by the suggestion of all manner of eatables and drinkables, or by bringing them ready prepared to the bedside experimentally. This, no doubt, is very well at times—during convalescence, for instance; but as a medical man, I am persuaded that it is a mistake in the earlier stages of an illness, when all food is loathed alike, and the creation of an appetite is an impossibility. The only thing to be done is to impress on the invalid the necessity of taking what is ordered for him at stated times, just as he takes his medicine; and it should be prepared on the same footing as a medicine—with the understanding that it is a nauseous dose, and must be presented in a form that will admit of its being swallowed as compactly and rapidly as possible. It is worse than useless to employ flavoring matters at this stage, with the idea of making anything palatable; if you can render his food absolutely tasteless, as you will do far more for him. And beyond this forcible administration, so to speak, of a certain amount, I think little good is gained by suggesting this or that delicacy, in the hope that your patient may be induced to "fancy" something. We may take it for granted that when he feels inclined for anything he will ask for it spontaneously; and the promptings of nature are more likely to lead him to a choice of what is best for him, than our string of suggestions. I have frequently observed that when sick people have mentioned a desire for any special food, they almost invariably eat of it when it is procured; whereas it often happens, when they have been persuaded to assent to something which has been proposed, the inclination—if it ever existed—has passed away before the dish or article can be brought to them.

I say, "if it ever existed;" for there is no doubt that a patient often yields to suggestions in sheer extremity, simply for the sake of peace. I happened to be in a sick room the other day, when a relative arrived on the scene. She had been warned to repress all emotion, and succeeded very well; but her tender solicitude was wholly irrepressible. I am sure that she asked at least twenty questions in less than a minute, until the unhappy sufferer writhed under them. "Shall I raise your head a little? Will you have another pillow? Wouldn't you like your head a little higher? Let me fan you. Will you have the blind up? What can I get you? Some arrowroot? Do try some! I am sure you will be more comfortable with another pillow. Will you have one?—yes; do! I'll go and get one. Will you have a cup of tea? I'm sure it would do you good. A cup of tea won't take a minute," etc. The cup of tea has been a dreadful instrument of torture in the hands of well meaning people, who would not knowingly have teased a fly.

These are small things, you will say. But a small thing in health is often magnified to a grave matter in sickness, and the sum total of them all may be as serious in their effect as the disease itself. It will be seen that the few points upon which I have laid stress are such as are calculated to promote tranquillity of mind—which, indeed, is half the battle in medical treatment. It is generally conceded that a trained nurse, who has no interest in the patient beyond that which the duties of her office impose, is better fitted to expedite his recovery than those who are bound to him by ties of affection, however welcome their presence may be in the hour of affliction. Whether the reader will agree with me or not, my experience in foreign countries has impressed me with the conviction that men make far better nurses than women.

Fish Analyses.

The only published analyses of fish which we have in this country, calculated in such form that they can be compared with one another and with other foods, are given in the volume, "Food: Some Account of its Sources, Constituents, and Uses," by Professor A. H. Church. It forms one of the series of South Kensington Museum science handbooks, and is intended as a "guide-book to the food collection" of the Science and Art department, which, some seven years ago, was removed from South Kensington to the Bethnal-green Branch Museum. The old analyses given in the Bridgewater treatise, and those of J. Pereira, one of the first Englishmen to pay attention to the chemical constituents of foods, are now of no practical use, as the compounds are expressed in combinations, which are no longer used in calculations respecting food values. The analyses given in the "Food" hand-book, the last edition of which is 1876, are only for salmon, mackerel, sole, conger eel, pike, and herring, and these it is stated are quoted "under all necessary reserve" from a former edition. Professor Church did, in 1876, incorporate one original analysis, that of the herring, and it differs considerably from that quoted from the former edition. The difference is as great as this, the calculations being made for a pound of flesh: Nitrogenous matter (old analyses), 3 ounces 317 grains; (new) 2 ounces 70 grains; oil or fat (old), 1 ounce 56 grains; (new) 2 ounces. In the more recently published "Nahurugs-und Genuss-mittal," by Professor Koenig, there are several analyses given, but, with the exception of an old analysis by Frank Buckland, they are all from Continental laboratories, and therefore presumably made from examination of Continental specimens of fish; and as fish vary so much in different localities, it is by no means certain that they may be safely taken as representing fish that comes to the British market.

The great difficulty that lies in the way of making use of practical calculations of any of the published analyses is that no statements are given as to the time of year at which the analyses were made, nor of the condition of the fish. It is well known that fish vary much in their composition, especially in the amount of fat they contain, at different times of the year. There is also a difference of fish even of the same species caught off different parts of our coast, as, for example, a Dover sole is "instinctively" recognized as different from a Torbay sole, though we are without analysis to tell us what the difference is as regards chemical composition. Every one must have remarked the great difference there is in the richness of herrings, both in regard to season and the place they come from. There is this further drawback to relying on published fish analyses for practical purposes, that it is not stated whether they are the average of many analyses or are single experiments.

As a matter of fact, fish analyses have not been wanted for any practical purposes till now. The public dietaries for our soldiers and sailors, our pensioners, our reformatory boys, our paupers, and our criminals, have never included fish even in localities where fish is plentiful. There have been many returns at different dates to the House of Commons on workhouse dietaries, but they may be searched in vain for any mention of fish. As regards soldiers' diet, it is true that several hundred portions of fried fish, principally plaice and haddock, are sent daily to the barracks of our Guards in London at tea time, and the men are allowed to purchase of the privileged dealer what they care to pay for, but it does not form any part of their regulation diet. This year an attempt has been made to introduce fish into workhouse dietaries, but the first attempt at Canterbury was a signal failure, the inmates asking that they might be allowed to have their former diet. In one or two other workhouses since then, where double the quantity of fish has been substituted for meat, it has been received with less disfavor. Unfortunately, the only information given in any of these cases is the vague statement, "Fish was substituted for meat." With regard to "meat," most of the returns very clearly stated not only which are "beef days" and which are "mutton days," but what are the joints used. It is well known, chiefly from the many years' experiments at Rothampstead, not only what is the nutriment value of cattle and sheep of different breeds and in different conditions, but the value of different parts of the animals is known. The vague term "fish" conveys no information as to nutriment value at all. Allowing for all imperfections in the exactness and fullness of our knowledge of fish, the English and the Continental analyses show unmistakably that some *genera* have far higher food values than others. For example, the nitrogenous, or flesh forming compounds, differ as follows (according to the hand-book), the calculations being per pound of flesh: Mackerel, 3 ounces 387 grains; conger eel, 3 ounces 233 grains; pike, 3 ounces 23 grains; salmon, 2 ounces 48 grains; sole, 1 ounce 350 grains; herring, 1 ounce 270 grains. Thus the flesh forming compounds in mackerel may be reckoned at double the quantity present in herring, even if the newer analysis of 2 ounces 70 grains be taken. The amount of fats, or heat and force producers, is quite a secondary consideration, because they can be had from flour and rice and many vegetables, and the fat with which fish are cooked, but none of which contain more than very small quantities of flesh formers. It is hardly to be expected that salmon and soles should be introduced into public dietaries, but mackerel and herrings are often cheap enough. The importance of knowing the composition of the flesh of fish is at least illustrated by the comparison of these two. If the rations are served by weight, then there would be double the amount of flesh forming material served out when mackerel is used than when herring is used; if they are served on a chemical basis—in many dietaries they are—then twice the weight of herring must be served to what must be given when mackerel is used. For comparison, the flesh forming compounds in beef may be taken at about 3 ounces, that is of the parts that can be eaten and digested, and mutton rather less.

The question of cost of course largely enters into calculations in public dietaries; even supposing the flesh forming constituents of fish are given at the highest amount when in best condition, it is evident they are not less than that of meat, while the cost is far less. Of the cheaper fish, such as plaice, haddock, whiting, there do not seem to be any analyses at all, and, therefore, the introduction of these into dietaries would be an uncertain step at present.—*Journal of Society of Arts.*

Wasp Stings.

This being the season at which petty questions and grievances are most likely to be relieved or redressed by the publicity offered by the press, a considerable number of correspondents are expressing the burning interest they take in the treatment of "wasp stings." There can be no doubt that under certain conditions the sting of a wasp may prove very injurious, or even dangerous to life. We are unable to indorse the opinion that there is no danger unless there be fear. It is quite possible that the sting of any insect capable of generating a poison may be fatal without the intervention of panic. The nervous system is in some of its states exceedingly susceptible of sudden impressions, which, as it were, "stagger" the nerve centers by shock. The bites of small snakes probably act in this way, and the sting of a wasp may prove fatal in the same fashion. As to remedies, ammonia is, of course, the obvious recourse; but almost anything "strong," in a popular sense, will generally suffice to decompose and destroy an organic poison if instantly applied. This is why the juice of an onion answers the purpose. Anything equally pungent would do as well.—*Lancet.*

Home the Best Place for Invalids.

The New York *Sun* compiles from the *Continent* the opinions of a physician about the curative powers of nature. The physician concludes that it is better for a consumptive to stay at home, where he can be comfortable, than subject himself to the discomfort of hotel life, or to the greater inconvenience of a camp. He says that the camp cure may be fairly tried by sleeping on one's own house top. Another medical man replies that the summer conditions of spruce forests are eminently favorable, and consumptives have recovered in the most surprising way living under canvas in them, where the air is impregnated with the healing emanations peculiar to the non-deciduous tree growths. There are consumptives whose lungs crave the salt air of the ocean; others to whom the dry atmosphere of Colorado is infinitely soothing; and others again who are benefited by the climate of Florida or Southern California. "To prescribe Florida for one person might mean death, while if he went among the northern paradise of spruce, recovery might follow."