E FLASH PICTURE.

derful Results Based Upon the Homely Discovery of an English Photographer.

Y HE MADE HIS DRY PLATES.

on's Kinetograph Would Not Have Been Possible but for This Man, Now Dying in Poverty.

TOGRAPHING FROM THE CLOUDS.

cent Likenesses of the Field of the Microscope and Their Use to Doctors.

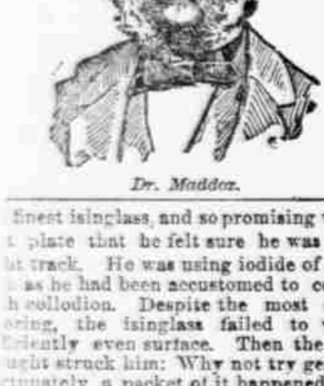
[WRITTEN FOR THE DISPATCH.]

Dr. R. L. Maddox, of Southampton, land, the art of photography owes its important step forward since the time Daguerre. It was in 1871 that he in the gelatine dry plate, as the result periments intended to improve on the llion process. His objections to that ess were manifold. It was costly and , the manufacture of the cotton was lesome, and the collodion vapor in usly affected the photographer's health. Dr. Maddox's own opposition to the r was joined that of his household, as ppressive odor pervaded every room in house.

ing paper and glass by turns, he be Exhausting the contents of his chem shelves, he proceeded to draw upon resources of the family pantry. Lichen, ed oil, quince seed, tapioca and wax , each in succession, combined with ing proportions of silver salts and made plates. At times one of the plates ld give an encouraging result. Then proportions of its ingredients would be nged carefully, only to have success, as it seemed within reach, slip away.

Resorted to Animal Compounds.

nce vegetable substances failed him, not try animal compounds? More plex, they might be more unstable, therefore more sensitive to light. Maddox mixed white of egg with silver, but in vain. He next employed



Dr. Maddox.

finest isinglass, and so promising was the plate that he felt sure he was on the ht track. He was using iodide of silver, as he had been accustomed to combine h collodion. Despite the most careful ering, the isinglass failed to yield a ficiently even surface. Then the happy ught struck him: Why not try gelatine? rtunately a packet of it happened to be the house, and by dissolving it he se ed a much better surface than he had h the isinglass. Just then he had been otographing some laurels, making a er poor picture. What could improve s imperfect plate? He remembered hav heard that for foliage the bromides e better suited than the iodides. To bromides, then, increasing the quantity d lessening that of the iodides, he turned. marked, at that point, was the success, e settled on the use of bromide alone. en the first effective dry plate saw the ht of day. Dr. Maddox at once pub ed his experiments. To some of the st ingenious minds in the ranks of pho raphy, professional and amateur, their se was as certain as dawn. Very soon gelatino-bromide plate, as we now know was brought to perfection.

Raising a Subscription for Him.

In the final improvements Dr. Maddox k no part, as his health had broken wn and he was forbidden to work. In a subscription, toward which American otographers are making handsome contri tions, is being raised for him because he infirm and poor. Apart from the sub iption, the man whose skill, fertility of ource, and perseverance led the way to so ny triumphs of science and art has been rely without reward.

cause pictures obtained with collodion ates are the most delicate and beautiful camera can give, repeated attempts have n made to increase their sensitiveness, so far without practical success. The ate we owe to Dr. Maddox continues to ld its place as incomparably the most ld and convenient the photographer can ploy.

Let us glance for a moment at some of revelations won through its exquisite sitiveness. In the hands of Muybridge, Philadelphia, with exposures in extreme es estimated at only one five-thousandth a second, horses have been photographed lking and galloping, athletes running and mping. That and similar work has had dded effect on pictorial art. Meissonier d other artists of eminence have given us presentations of animal motion revised in e light of the camera's disclosures. In tching the swiftest motion in an instan neous phase the dry plate far excels the pability of the quickest eye.

Seeing Photographs in Motion.

That, however, is only one of the many ays in which visual capacity falls below at of the dry plate. But if the eye, mo ent by moment, cannot separate the hases of motion, it can nevertheless follow at motion in its continuity. Can pho graphy reproduce such an impression? If can, then it may boast not only much ower that the eye has not, but also every ower that it has. In its first attempt to nex this last outlying province to its mpire the camera allied itself with a de ice regarded, when first invented, as little ore than a toy. In its familiar form the etrope, or wheel of life, consists of a linder, eight to ten inches in width. It open at the top, and around the lower lf of its interior is placed a series of pict es showing, let us say, a horse in the suc ssive motions of a leap over a hurdle. ese pictures are looked at through narrow rtical slits in the cylinder, the apparatus ing meantime revolved rapidly. Before e image of the horse in its first attitude as had time to fade from the retina, a sec nd image showing the next phase of the ap is received, and so on throughout the ries. Through this effect of the persist nce of vision, as it is termed, the impres ons blend into continuity, so that one ems to be looking at a horse in quick mo on through the air.

Edison's Contribution to the Idea.

In the early days of the zoetrope its ictures were roughly executed wood cuts. hen these were replaced by a succession f instantaneous photographs, much better ffects were produced. Something, how er, was wanting. The photographs were aken at too wide an interval of time for heir outlines to fuse with precision. That as the condition of affairs when Mr. Edison egan work on the kinetograph. For the reparation of its pictures he has invented a machine which takes photographs on a arrow continuous strip, at intervals of only ne-forty-sixth of a second, the exposure sting one-sixtieth of a second. The images are developed by carefully timed machinery. When the strip is moved swiftly under an eye piece, an incandescent lamp affording the needful light, the impression of witnessing rapid motion is reproduced perfectly. And the most surprising result is that the appearance of relief, of solidity, is united to that of continuous movement; through the single eye-piece all the effect of a stereoscope comes to the eye. In the apparatus now being completed at Mr. Edison's laboratory a series of views from his blacksmith shop is presented. The three workmen are seen successively striking the bar of red-hot iron, and at proper intervals assuaging their thirst. In his first model Mr. Edison took pictures half an inch square, in the next he essayed dimensions an inch square, and found his difficulties to be very much greater than in the first case. In the stereopticon the images can be enlarged to life size and thrown upon a screen with astonishing vividness.

Possibilities of the Instrument.

The kinetograph bestows a distinctly new and most important gift on mankind. In as far as nerve and muscle can be educated by imitating the dexterity of mechanic, chemist, surgeon, or artist, its reproductions will be invaluable. They repeat every movement of the hand, not simply as one might observe it at work, but as the eyes would see it if they were quickened and sharpened tenfold. A good deal might be learned by watching in this way how an Australian throws a boomerang, a Daccan weaves the tissue so delicate as to be called "woven wind," and how the artists of Japan form and decorate their pottery and bronzes.

For an example of the benefits we may expect to find bound up in this new acquisition, let us note its availability in teaching the dumb to speak. Deaf mutes learn to interpret what is uttered by closely observing the moving lips and facial muscles. Let a speaker's lips be photographed, in their series of motions, as he says, "How are you?" In the resultant pictures placed in the kinetograph the learner may observe the motions of articulation until he has mastered them perfectly. An artist who sees a quarrel, an embarkation, a group of youngsters picking berries, finds the groundwork for a popular canvas or etching. His camera does not supersede the pencil and brush, but simply frees him from the drudgery of filling his sketch book and portfolio. Later, pencil and brush do their work in arrangement, in composition, in the suppression and emphasis in which so much of art consists.

What a Camera Can Do.

Not only can the photographer get pictures of inaccessible places with the camera under his hand, he may on occasion send his instrument to points where he cannot follow it. Lowered through a chink, into a quarry rent with earthquake, it has been the means of rescuing a score of imprisoned workmen. Sent to the depths of the sea it has brought up records of what it saw there. Attached to a balloon, it has been floated over an enemy's camp and returned with full intelligence of his strength and distribution. In a photograph obtained 700 yards above Stamford Hill, in the northern part of London, the topographical features were so well defined that, with the aid of a microscope, the smallest objects could be recognized easily.

On ordinary ground having no extreme distances of level, it is now practicable by balloon photography to attain more accurate plans than those of ordinary surveying. For that exacting kind of work lenses are demanded having wide, flat fields, and giving perspective with the utmost truth. To the opticians who have made these lenses photography owes a debt only second to its obligation to the chemists who have so much enriched the resources of both the camera and the various processes which follow its work. In a recent combination by Dallmeyer, an instrument is at once telescope and camera, a welcome simplification in taking pictures at long range.

Combined With the Microscope.

As lenses have been refined and perfected, photography has been applied to higher and higher powers of the microscope, until now we have prints exhibiting the sections of leaf buds amplified more than 8,000 diameters resolving their threads into beautiful beads. The best work of this kind in England has been done by Dr. Maddox, whose compeer in this country was the late Colonel Woodward. Photo-micrography now furnishes images of the bacteria whose multiplication means diphtheria, typhoid and other deadly diseases. It enables abnormal conditions of the blood and tissues to be portrayed, as a basis for comparison in the treatment of yellow fever and similar ailments.

These are only a few of the benefits the physician receives from the camera. It photographs the larynx in the act of utterance, and in both health and disease. Obscure derangements of the eye and of other parts of the body, difficult to observe, have been limned on the sensitive plate for leisurely examination. On analysis of one of the series of instantaneous photographs taken by Mr. Muybridge, showing patients with impeded or violently excited movements of the limbs, it was found necessary to correct former explanations of the nervous and muscular derangements involved. The same method of portraiture is now applied in France, with great instructiveness, to epileptic and hypnotic patients.

A New Exposure Meter.

In taking a picture in a dimly lighted hospital ward or other obscure interior, or out of doors under dense foliage, the photographer, especially if he be an amateur, has trouble in deciding the time of exposure. With frank recognition of the difficulties it expects to meet, a new English exposure meter greatly reduces the chances of taking a poor picture.

As photography multiplies on every hand its alliances with art and science, the amateur is likely to become less and less satisfied with random shots at anything and everything. He sees how, by giving it some definite aim and connection, he can invest his work with a fresh and vivid interest. Perhaps a bridge is being constructed in the neighborhood. As the spans rise from day to day he follows the process, some insight into the methods of modern engineering resulting. Last year while the beautiful groined ceiling of the new public library in Boston was being cemented a series of photographs was taken revealing the rare ingenuity of the Italian builder. At times work of that sort rises to very practical worth. The designer of the Exhibition grounds at Chicago, Mr. F. L. Olmsted, receives photographs once a week in Boston showing how the plans are taking form. In such a report there can be nothing forgotten or glossed over.

GEORGE ILES.

Block Signals on Railroads.

North American Review.]

Many railroad accidents would probably be saved by block signals and interlocked switches and signals. I would not say unqualifiedly that every one of the roads on which accidents happened last year should at once equip its tracks with block signals and interlock all of its switches. There are reasonable limits within which they must work; but it may be said witout qualification that it is poor railroad economy to operate a road having a heavy and fast traffic without block signals and interlocking for the protection of switches. It can be proved by the statistics of the cost of accidents that a judiciously-planned block system pays in money, and generally on a crowded road it actually facilitates the movement of trains.

A Grateful Woman.

I am so thankful that Mrs. Wymen told her experience in your columns last month. My husband has been sick and we have several small children and I had to do something. Mrs. Wymen's success with the plater led me to believe that I could make a little money, too. I obtained a plater for $5 and have been plating for the last three weeks, as I could find the time to leave the house, and have made $36 50. I would not have believed that it was so easy to make money with the plating machine. Everybody has a little work they want done, and I sold two plating machines and made $5 apiece on them to friends who wanted them for their children. Anyone can plate and anybody can succeed, as I have done. There is no experience needed. My husband says when he gets well he is going into the plating business. Anyone can obtain circulars by addressing H. F. Delno & Co., Columbus, Ohio, where I got my machine.

MRS. TORRY.

THE BOOK OF ISAIAH.

A Discussion of the Arraignment Against the Prophet's People.

DEFENSE AND THE PUNISHMENT.

The Advantage of Reading the Bible in Some Foreign Language.

NEED OF RELIGION IN POLITICS

[WRITTEN FOR THE DISPATCH.]

It makes a great deal of difference how one reads the Bible. Some parts of the Bible are so familiar that we know the words by heart. The consequence is that they make little impression upon us. Other parts of the Bible are so difficult that we cannot understand them. The Bible, accordingly, is to many people, one of the dullest books in the world. Leave a man in a room alone with two books, one of them a Bible, and the other any stupid book you please, and see if he will not take the other book. The Bible is really the most interesting, the most uplifting, the most wonderful book that was ever written. But it has to be read in the right way.

I talked once with a Kentucky farmer who lived five miles from the Mammoth Cave. He was aware that there was such a cave in the neighborhood, and that people came from long distances to see it, and that wonderful things were said about it. But he had never explored it. He informed me, however, that he had ventured a considerable distance into a number of other caves! Somehow, we too know a great deal about a number of lesser books, while we lack interest in the supreme book.

The Bible in a Foreign Tongue.

Let me make some suggestions about reading the Bible. If you know French or German, let me advise you for a time to read the Bible in those unfamiliar words. You will be surprised at the new meanings that will be discovered in it. If you do not know French or German, let me offer another counsel. We are not yet very far from the beginning of the new year. There is still opportunity for good resolutions. This year do not read the Bible at all. Instead of the Bible read these four books, which follow along the lines of the Bible: Stanley's "History of the Jewish Church," Edersheim's "Life and Times of Jesus, the Messiah," Conybeare and Howson's "Life of St. Paul," and Farrar's "Early Days of Christianity." You will find that you will presently be reading the Bible in spite of yourself.

If, however, instead of accepting either of these suggestions, you desire to read the English Bible in the King James' Version, you will find great help in a good commentary. The little Cambridge "Bible for Schools," in quite a number of inexpensive volumes, is the best general commentary I know of.

I want to study to-day, the first five chapters of the book of Isaiah. The first of these five chapters can be set under four headings; (1) the charge, (2) the defense, (3) the promise, (4) the punishment.

The Rebellious Children.

God makes the charges, and the defendants are the people of Judah and Jerusalem. The charge is that they are rebellious children. That sums it all up. God is their Father; He has brought them up, and cared for them, and loved them, and they have turned away from Him.

And what is the people's defense? Why, that the services in the temple are more elaborate and beautiful than they have ever been before, that sacrifices are daily offered, prayer is hourly uttered, and all the holy seasons reverently kept. To which God answers that ritual without righteousness is abominable in His sight, that no magnificence of ecclesiastical architecture, no beauty of ornate service, no costliness of sacrifice, can be of any value apart from genuine obedience to His moral laws. "Wash you, make you clean, put away the evil of your doings from before Mine eyes. Cease to do evil, learn to do well." Thus alone can man expect to win the approbation of the righteous God. Do justice to the fatherless, protect the widow, help the poor.

That was more than 2,500 years ago! And Jesus of Nazareth has lived in the world since the words were spoken, and brought all the emphasis of His divine life into the cause of true religion. And yet even to-day we

Need Two Sermons Every Sunday

on this same old text. Even to-day we understand but dimly that theology and sociology go together, that Christ himself put them together into two commandments which He pronounced alike in their essential value. And Lowell's poem, which, if it had been written in Hebrew might have been fitly set here among the sermons of Isaiah, needs to be read to-day.

"With gates of silver and bars of gold
Ye have fenced my sheep from their father's fold;
I have heard the dropping of their tears
In heaven these eighteen hundred years.

"O Lord and Master, not ours the guilt,
We build but as our fathers built;
Behold Thine images, how they stand
Sovereign and sole, through all our land."

Then Christ sought out an artisan,
A low-browed, stunted, haggard man,
And a motherless girl, whose fingers thin
Pushed from her faintly want and sin.

These set he in the midst of them,
And as they drew back their garment-hem,
For fear of defilement, "Lo, here," said He,
"The images ye have made of me!"

The Promise of a Pardon.

Nevertheless, there is a promise. Whoever turns back to God and seeks to do Him service, offering to Him the acceptable sacrifice of a just, and upright, and helpful life, trying to serve God, not only in the temple, but out of it also, at home, and in the street, and through the hours of business, God will receive and forgive. Yet God knows that the promise of pardon will not be heeded. The chapter closes with a prophecy of punishment. And yet not a universal nor a final punishment. Some will turn and be saved; and after punishment there will be righteousness.

The next four chapters belong together. They were probably preached at the close of the reign of Jotham, or at the beginning of the reign of Ahaz. These chapters are all one sermon. And they are different from most other sermons in the Bible in that they begin with a text. The text, which was also used by Isaiah's cotemporary, Micah, is at the beginning of the second chapter. Nobody knows who wrote it; probably some older prophet than Isaiah or Micah, now forgotten. It sets forth an ideal of the kingdom of God.

One day in Jerusalem the man who had that call from God of which I spoke last week stood up to preach. He was not an ecclesiastic. He was not a professional instructor in religion. He was only a layman, a young man belonging to one of the prominent families of the city.

Not Every Preacher a Parson.

That is worth remembering. That the greatest preacher of the Old Testament was not a clergyman at all. The idea that all the preaching ought to be left to the parsons, is one of the most mistaken ideas in the world. Every layman, according to his ability, ought to speak every chance he has for the cause of righteousness. The two religious societies which have made the most remarkable progress in the course of recent history are the Methodist Church and the Salvation Army, and in both of these emphasis is laid on the importance of lay preaching.

This young layman stood up somewhere in the city, in a court of the temple, in the market, or on the curbstone of some crowded street and recited his text. And at once, as he uttered the words, his eyes fell upon the people who were hindering the fulfillment of God's ideal for his people. Some were soothsayers, dealers in magic, devotees of false and degrading religions; some were rich people, riding by in handsome carriages, decked out with gold and silver and all manner of luxurious adornment. At once the preacher flames out against them. On account of such as these the church and the state are alike in peril. For their sins the lofty towers of the great city shall be laid low.

The sermon which is contained in these four chapters falls into three divisions: (1) The ideal of the kingdom of God, (2) the hindrances to its fulfillment, and (3) the sure punishment that awaits the hinderers.

Progressive Ideas of Jehovah.

The ideal of the kingdom is the absolute reign over it of the God of Sion. It is the God of Sion, of the holy city, of the temple, God the father of His people; not the God of Sinai, of the bleak desert, of the law, the terror of the nation; who is to rule over the ideal kingdom. All religion is progressive. God changes not, but our ideal of God grows wider and higher and truer, as we grow. Isaiah knew more of God than Moses. We know more of God, ought to know more of God, than Isaiah.

The God of Sion is to rule some day over all the nations of the earth. Isaiah looked forward to that day; Jesus looked forward to that day, and taught us to pray for it. We are looking toward it still. John Fiske, speaking as the prophet of our most modern philosophy, closes the pages of his paper on "The Destiny of Man" with a look into the future such as Isaiah dimly had in the old time. It is this old chapter translated over again, with all the wisdom of the ages since brought into it.

"It shall come to pass in the last days," says Isaiah, "that the mountain of the Lord's house shall be established in the top of the mountains and shall be exalted above the hills; and all nations shall flow into it. And many people shall go and say, come ye and let us go up to the mountain of the Lord, to the house of the God of Jacob; and He will teach us of His ways, and we will walk in His paths; for out of Sion shall go forth the law, and the word of the Lord from Jerusalem. And He shall judge among the nations, and shall rebuke many people; and they shall beat their swords into ploughshares, and their spears into pruning hooks; nation shall not lift up sword against nation, neither shall they learn war any more."

The Promise of the Future.

"The future," says Fiske, "is lighted for us with the radiant colors of hope. Strife and sorrow shall disappear. Peace and love shall reign supreme. The dream of poets, the lesson of priest and prophet, the inspiration of the great musician, is confirmed in the light of modern knowledge; and as we yield ourselves up to the work of life, we may look forward to the time when in the truest sense the kingdoms of the world shall become the kingdom of Christ, and He shall reign forever and ever, king of kings, and lord of lords."

The realization of the Fatherhood of God, as Isaiah faintly saw it, as Christ plainly saw it, will be the supreme characteristic of the ideal kingdom. God is our Father, the Father of the meanest, the obscurest, the poorest, even the most depraved of human kind, and all we are brethern. Even now we are but beginning to realize the blessedness, the desirability, the supreme necessity of that old ideal.

Isaiah says that that day of the Lord will come not by force, by conquest, by the sword, not by insistance upon uniformity nor by persecutions for heresy, not by strikes nor by lockouts; no, by instruction, by teaching, by the persuasiveness of the simple truth.

No War in Isaiah's Future.

Isaiah says that when the day of the Lord comes all unbrotherliness will slink away out of its glorious light. And he singles out for illustration that most unbrotherly of all our institutions—war. All disputes will then be settled, he says, by arbitration. God will be the Judge; that is, all troubles will be adjusted by reference to the eternal laws of God. The military establishments which exist in the nations of Europe will be exchanged for industrial conditions; swords will be converted into ploughshares. Nor will there ever be any further instruction given in the art of war.

The two chief characteristics of the ideal kingdom, then, are truth and love; truth in doctrine, for God will be the teacher; and love in conduct, for God will be the judge.

Now, in Isaiah's time, what hindered the coming of this ideal kingdom? The preacher, in his sermon, gives an abundance of plain answers. In the second chapter, he says that the hindrances are the soothsayers and the worshipers of idols, and the possessors of inordinate riches. In the third chapter he says that the hindrances are the elders and the princes who oppress the poor, and the aristocratic ladies who think only of their fine apparel. In the fifth chapter he describes the hindrances under the headings of six woes: woe to the great landlords, woe to the luxurious livers, woe to open sinners and sacrificing unbelievers, woe to the teachers of a false morality, who persuade people that stealing and lying are all right when they are carried on upon a large scale in business, and that murder is commendable when it is done by a large army in war, woe to the self-conceited politicians who oppose reform, woe to the unjust judges who oppress the poor.

The Root of All Evil.

That is, the root of all real hindrance to the coming of the ideal kingdom was the love of money. That is to be read between the lines, and in the lines themselves, of these stern chapters. The love of money, which even yet is not extinct.

Then follows the declaration of punishment. Isaiah says two things about this absolutely certain punishment. It is a consequence. Really, we punish ourselves. We set in motion the great inevitable laws which visit our transgressions on our own heads. Sin is a cause which always has punishment for a consequence. There is no escape from punishment. And punishment is remedial. God has set this consequence with this cause, not in anger, but in mercy, for our good. All punishment in this world, and in the world to come must be remedial. Or else, God is not as good as we are.

Finally, it is worth noticing that in all these utterances of Isaiah, he addresses not the individual but the nation. We need a great increase of national religion. We need to bring the Creed, the Lord's Prayer, and the Ten Commandments into our national politics; especially, as recent instances remind us, into our dealings with other nations. We need to learn that whatever is wrong for an individual is wrong also for a nation.

GEORGE HODGES.

A GRIDIRON OF SILVER.

Not for the Kitchen but Rather for the Bachelor's Outfit.

It is not just the thing you would choose to put in Bridget or Dinah's hands, but all the same a wonderfully fetching bit of kitchen furniture. It is full of dainty tendrilly curves and shines as bravely against its velvet background as any tankard or trophy of them all. There is a

suggestion of use, too, for all its white splendor. The lignum-vitae handle sits firm and steady enough to assure you that it will bear the weight of even a thick porterhouse. It is unlikely though that it will ever be put to so gross and material a test. Such gridirons do not go into even the most luxurious kitchens proper. They are rather among the elegant accompaniment of the chafing-dish cookery, in which so many of society's swell bachelors are reputed to be expert.

OUR BOYS AND GIRLS.

HUNTING IN MONTANA.

How Army Men Kill Deer in Winter—Snow Shoeing in the Mountains—Habits of the Pretty Animals—Using a Carcass as a Toboggan.

[WRITTEN FOR THE DISPATCH.]

In 1879 the country in the northwestern part of Montana was practically a wilderness. Fort Missoula, on the western slope of the Rocky Mountains, was the last outpost in this direction, and between it and Lake Coeur d'Alene there were vast game preserves untroubled by white men.

My regiment was stationed at Fort Missoula, and in company with one of the officers, an ardent and accomplished sportsman, I spent most of my time in the mountains. The winter hunting was always best after a fresh fall of snow. The old trails made by the animals were partly filled up and the new trails could be followed easily. Still, this advantage was about balanced by the absence of foliage, and the consequent great distance at which the hunter became visible; also the glistening white surface of the snow lit up the recesses of the thickest woods, and we had to take the utmost care to avoid being discovered by the game. Then, too, when thaw and frost alternated the snow-crush became thick and the sound made by walking through could be heard long distances, even with snowshoes.

Sleeping on Pine Boughs.

The hunting ground decided on, our first care was to find a secure spot to pitch the tent. The thermometer often fell to 40° and 50° below zero, and a sheltered place, near wood and water, was a necessity. The very best shelter was in thickets of "lodgepole" pines, so called because the Indians use them as poles for their "lodges" or tents; they grow so close together that it is often impossible to squeeze between them. Growing tall and free from branches, and

A Novel Toboggan.

only two or three inches in diameter, a sufficient space could be easily cleared. Our beds were made of the fragrant ends of pine and tamarac boughs, covered with buffalo robes and blankets. Then the Sibley stove lighted, we could defy wind and weather.

As soon as it was light in the morning we cooked our breakfast and were off.

Our hunting suits consisted of heavy underwear, "prairie broadcloth" (canvas) coat and trousers, moccasins or rubber boots, under which was worn several pairs of stockings, a flannel shirt and a close-fitting cap that could be pulled down over most of the head in case of a blizzard. But such was the violent exertion of those mountain climbs the cap was never worn unless we had to face a storm; it was habitually carried slung to the belt and an ordinary white handkerchief was tied around the head. Our appearance with this headgear, and our faces well blackened around the eyes with charcoal to lessen the effect of the light and prevent snowblindness, was anything but prepossessing, but the comfort was unspeakable.

Habits of Deer in Cold Weather.

Soon after leaving camp the coats would follow the caps and be slung to the belts or the light, strong rope that each carried around the waist or over the shoulder. On cold nights the deer leave the mountains and come down to the valleys and take shelter in the brush by the streams. When the day breaks they commence to climb the mountains, feeding as they go. This habit gives the hunter who makes an early start an opportunity to head them off and as they are feeding it is easy to approach unseen.

On this particular hunt my friend and I followed the spurs of the mountain and we soon were walking along the first plateau on an old deer trail well beaten in the deep snow. Expecting to find a fresh trail any minute we put on our snow-shoes and as it was a little late turned off up the side of the mountain. Soon the rising sun made it sufficiently light to see distant objects, and on the side of a little gulch we made out lines of irregular, meandering trails, leading from one good feeding ground to another. The next moment we discovered that three deer were above us. Unless they had seen us we would be able to head them off and get a shot at them.

Three Animals Brought Down.

Retracing our steps until we reached the gulch adjoining this we silently snowshoed rapidly up it. After ascending a half mile we crossed back and approached carefully, looked about for our game, but no deer were to be seen. Continuing on upward we reached an overhanging cliff when we saw our three deer emerging from the same gulch we had so rapidly toiled up in order to head them off. For some reason they had crossed over, too, and had leisurely followed up in our footsteps.

But they were pursuing a course that soon would bring them within easy range. Moving back from the edge of the cliff, we made ourselves comfortable and waited for them. When they got close we took positions where we could see, but not be seen, settled to who the first shot belonged, opened fire, and were fortunate enough to get them all.

Then came the prosaic part of hunting large game—butchering it. My companion and I had reduced this to a science. We always hunted together, for the localities we most frequented were rugged and dangerous, especially so in winter. One of our brother officers had lost his life—frozen to death—while hunting, and we found a decided comfort in being together when danger came upon us, as it often did; besides it lightened our work.

Tobogganing on a Carcass.

We always butchered our game, and in winter dragged it into camp, sometimes five miles. In butchering we took the light ropes that we carried and swung the deer up by his hind legs between two trees; this made the work comparatively light. The three deer thus disposed of, we made tea in a tin quart cup, melting snow for water over a little fire. Lunch over, we tied the ropes around the necks of the deer, a half hitch being taken around their noses, and then the homeward haul commenced.

Keeping along the mountain side we finally gained a point nearly above our camp. Then we put in practice a labor-saving device that generally afforded us much satisfaction. Selecting a slope free from trees and brush, one of the deer was let to slide down the declivity. The other two, now frozen stiff, were arranged as toboggans, their heads pointing down hill so that they would slide with the grain of the hair. Then sitting astride and holding on to the forelegs, down over the thick crust we flew. Sometimes hauling, sometimes sliding, we at last arrived at camp, where the deer were hung up to lodge poles.

Then supper and an early bed.

F. P. FREMONT.

Lieutenant, U. S. A.

BEAUTY IN CANDLELIGHT.

Nothing Sets Off a Woman's Face So Well and the Sticks Are Ornaments.

Until pretty women go out of fashion candles won't. Nothing bring out all the prettiness in a woman's face and suppresses all that is unlovely, like the soft light of a waxen taper. And the candlestick is today, by all odds, the prettiest bit of bric-a-brac in the home.

There are candlesticks in glittering cut glass and silver, with many pendants that glitter like Mrs. Astor's diamonds, and cups that curl up into translucent water lilies or tulips. Then there are "pinky porcelain trifles" in Dresden china, with shepherdesses and their swains wooing each other under the curling arms of the

The Wooing Shepherdess.

candelabra, or set singly to guard one of a pair and left to cast languishing looks at each other from opposite ends of the dinner table. There is no more quietly artistic ware in the market than the Rookwood pottery in its charming tints of olives and bronze and yellow browns, shading out sometimes into salmon pink and cream white. The Rookwood candlesticks are all low and have trays, and the decorations are sleepy little children's faces or a nodding old man.

The silver candlesticks are costly and splendid, and the bronze ones are costly and not splendid, but the real love of her who loves candlesticks as she does children, for themselves alone, goes out toward the curious old brass or silver-plated

Like a Great Cluster of Diamonds.

candlesticks she finds in the antique shops. A few weeks ago a woman found an old snuffer tray in a shop corner. It had lost its family and was counted of no value whatever. But this young woman had grown wise in the way of spending a little for a great deal. So she bought the snuffer tray for 25 cents. Then she took it to a man who repairs bric-a-brac and got him to solder on to it an old candle cup that he happened to have, on a pretty curved tube. Then she polished the whole piece elaborately and hung it up against the wall in her little drawing room. It was a delightful bit of brass, a sconce and a candlestick in one, and bought as she delighted to explain, out of a kerosene oil income.

HELEN WATTERSON.

ODDITIES IN TABLES.

Three Designs That Cannot Help but Please the Female Mind.

Few bits of house-plenishing appeal so strongly to the artistic housewife as the small irregular tables of the present fashion. Here are a few noted at random the other day in one of the swellest establishments in New York. Amid a bewildering array of glittering brass and onyx tables of all sorts, sizes and conditions you lighted upon one of the daintiest pink Numidian marble cut to a three-cornered shape, with a sort of clover-leaf rim projecting at each corner. It was just big enough to hold comfortably a tete a tete tea set, and just high enough to

be comfortable when you sit in a lounging chair beside it. Another low, dainty table was of light maple, very highly polished, and a double half-round shape, joined at the end, that two might eat or work, or read at it in convenient nearness, yet without interference. Still another in black and gilt was oddly tall—as high almost as your waist—with three legs holding together three bulbous crescents, each so placed that the indentation came near a leg, but not under the reach in the shelf above. Filled with odd or curious bits from all the world over, it could not fail to be a striking ornament, though it would never invite the all prevailing ribbon bow.

All Sorts and Conditions of Men,

No matter how widely at variance on other points, concede to Hostetter's Stomach Bitters sovereign potency in cases of malaria. This is the universal testimony from all classes. Chills and fever, intermittent, dumb ague, and ague cake invariably succumb to it. So do dyspepsia, la grippe, constipation, biliousness, rheumatism and kidney trouble. Emigrants to and sojourners in malarious regions should provide themselves with this genial means of protection.

STUDYING TO BE A DOCTOR.

An Old Practitioner's Advice to Boys—The Mistake of Being a Specialist—Allopaths and Homeopaths are Coming Together—Regard for the Code.

[WRITTEN FOR THE DISPATCH.]

A boy who is going to enter the medical profession should bear in mind that the training he will receive at the medical college is only the ground-work of his education; to borrow a phrase from the photographers, it is only the preparation of the sensitive plate upon which the impression is afterward received.

The young medical student's actual education begins when he "walks the hospitals." There he gains experience, practical knowledge, from real cases.

Then, if he has the means to do so, he should go to Europe and study again in Vienna, Paris and Berlin. It is sometimes asked why the medical student should go abroad to study his profession. The fact is that European physicians are much more learned than their brothers in this country. On the other hand, they are not as successful as we are in the practice of the profession. Their education is deeper and broader than ours, but, in the direct art of healing the sick, we achieve better results. They know more about the etiology, or theory of disease, than they do about the practical application of remedies.

Why Foreign Doctors Study More.

When you come to think of it, this condition of affairs is very natural. The aim of the foreigner, more especially the Frenchman or the German, is to obtain "honors," or a position under the Government. Official appointments are held in much higher esteem abroad than in this country. There are more honors to be obtained over there than here. There are all sorts of decorations which are coveted, confer distinction upon their wearers and command respect and homage. There are positions to reach which men will strive for half a lifetime.

In the United States the young physician is struggling, not so much for honor as for the almighty dollar; doctors here aim to produce results, the fruit of successful practice, that will bring in a financial return.

It has been asked why we have so many doctors. Beyond doubt the ranks of the profession are overcrowded; overcrowded beyond that of any other profession I can recall. It would seem as if, when a young man is good for nothing else he is supposed to have an aptitude for physic. In other words, doctors are too often made by the product of "exclusion," a word which defines a well-known medical process in diagnosis.

Winning a Paying Practice.

After the young physician has graduated and served his time in the hospitals, and returned from foreign study, it will take three or four years to get a fair start from the business point of view. How soon he will secure patients will depend very much upon opportunity and upon the industry with which he follows his vocation; for medicine is probably the most arduous of all the professions. Sometimes a doctor will advance on account of having married a rich wife. But neither wealth nor social position will avail him in the long run unless he has real ability and skill, and, above all, a certain amount of personal magnetism that will inspire confidence on the part of patients.

I have in mind a young man, who, in a very short time, has secured a practice in New York City of over $50,000 a year. Socially, he stood as high as it is possible for any man to stand in New York, and he had a certain amount of money himself which enabled him to live in much better style than the ordinary doctor. But he also had ability.

An interesting fact in connection with the medical profession is that it is being largely specialized. I think that the young man who starts out with the idea of being a specialist makes a great mistake. If he intends to be a specialist he should rather permit himself in the course of time to drift into the specialty for which he seems to be fitted. For, according to the French proverb, "That which a man loves to do he generally does well."

When to Become a Specialist.

After a young man has become an active practitioner and finds that the specialty toward which he is drifting is in the direction of his wishes, he is generally drifting in the right direction. That is the tide that will very likely bear him on to the greater usefulness, to fame, and to fortune. But the mistake of most young physicians is in adopting a specialty before they have had sufficient experience in general practice; they are not sufficiently well grounded in knowledge of the whole subject.

A specialist who is not a good general practitioner falls into the error of ascribing all the ailments that he comes in contact with to his specialty. The man who makes a specialty of the eye will ascribe all nervous disorders that he comes in contact with to disease of the eye. The man who makes a specialty of diseases of women will ascribe all the diseases that he meets with in women to disorders peculiar to the sex. I have frequently known throat and lung specialists to ascribe diseases which are, perhaps, purely nervous and functional, and which come from a disordered digestion, to obstruction in the air passages.

In one sense the specializing of medicine is beneficial. The study of physic is a vast theme. It is so great that it is difficult, yes, impossible, for a man to grasp it all. There is so much to be memorized that a man can not carry in his mind the particulars of every branch. And it may be said that a specialism that is based upon study and experience is the highest form of medical training.

The Homeopath or the Allopath.

It should be interesting to a young person contemplating the study and practice of medicine to note that the two branches of the profession—the homeopathic and the so-called allopathic—have had quite a wholesome effect, the one upon the other. They have been distinct and apart from each other, but now they are becoming less and less so every year. I doubt if to-day there is a single homeopath who practices exclusively the Hahnemann theory as promulgated by its discoverer.

There is a better personal feeling between the physicians of the two schools. Some time since in the New York Academy of Medicine an interesting question of medical ethics was vigorously discussed, whether a physician should be governed by a code which laid down definite rules and laws, or whether he should be governed by his sense of duty and honor. It was a fight between the advocates of a code and the advocates of no code. So far as I can understand the question was whether an allopathic physician should be at liberty to consult with homeopaths and others, or whether he should be restricted by the code from so doing, his violation of the code rule to be followed by a loss of standing in the profession.

The anti-code people won the victory on the occasion referred to, and it may be said that the tendency of the profession in regard to this matter is in the liberal direction.

CYRUS EDSON, M. D.

Mrs. Burnett's Literary Progress.

Mrs. Frances Hodgson Burnett, two of whose short stories have recently delighted readers of THE DISPATCH, is anchored to London. Her latest dramatic venture has been very well received by the London public, though, of course, it is hardly to be expected that she will repeat her success with "Little Lord Fauntleroy." She evidently has faith in the drawing powers of "The Showman's Daughter," as she has leased the Royalty Theater and engaged her own company, assuming the entire financial risk.

WILL call on you with samples and furnish estimates on furniture reupholstery.

HAUGH & KEENAN, 33 Water street.

su

LITTLE GLASS TUBES

That Tell Us Whether to Wear a Heavy Cloak or Carry a Fan.

HOW THERMOMETERS ARE MADE.

The Freezing Point Is Marked by Means of a Bath in the Snow.

MECHANICAL MEANS OF GRADUATION

[WRITTEN FOR THE DISPATCH.]

THE making of a thermometer may be either a delicate scientific operation, or one of the simplest tasks of the skilled mechanic, according to the sort of thermometer made. With the extremely sensitive and minutely accurate instruments designed for scientific uses great care is taken, and they are kept in stock for months, sometimes for years, to be compared and re-compared with instruments that are known to be trustworthy.

But so much time cannot be spent over the comparatively cheap thermometers in common use, and these are made rapidly, though always carefully. The method of manufacture has been so systematized within a few years that the very cheapest thermometer should not vary more than a fraction of a degree from the correct point.

Whether the thermometer is to be charged with mercury or alcohol; whether it is to be mounted in a frame of wood, pressed tin or brass, the process is substantially the same. Mercury is generally used for scientific instruments, but most makers prefer alcohol, because it is much cheaper. The alcohol is colored red with an aniline dye which does not fade.

Work of the Glassblower.

The thermometer maker buys his glass tubes in long strips from the glass factories. The glassblower on the premises cuts these tubes in the proper lengths, and with his gas jet and blow pipe makes the bulb on the lower end. The bulbs are then filled with colored alcohol, and the tubes stand for 24 hours. On the following day another workman holds each bulb in turn over a gas jet until the colored fluid, by its expansion, entirely fills the tube. It then goes back into the hands of the glassblower. He closes the upper end, and turns the tip backward to make the little glass hook which will help keep the tube in place in the frame.

The tubes now rest until some hundreds of them, perhaps thousands, are ready. Then the process of gauging begins. There are no marks whatever upon the tube, nothing to show the temperature of the atmosphere, and the first guide mark to be made is the freezing point, 32 degrees Fahrenheit. This is found by plunging the bulbs into melting snow. No other thermometer is needed here for a guide, for melting snow gives invariably the exact freezing point. This is an unfailing test for any thermometer whose accuracy may be suspected. But melting snow is not always to be had, and a little machine resembling a sausage grinder is brought into use. This machine shaves a block of ice into fleecy, snow-like particles, which answer the purpose as well as snow.

Getting the Freezing Point.

When the bulbs have been long enough in the melting snow a workman takes them one by one from their icy bath, seizing each one so that his thumb nail marks the exact spot to which the fluid has fallen. Here he makes a scarcely perceptible mark upon the glass with a fine file, and goes on to the next.

The tubes, with the freezing point marked upon each, now go into the hands of another workman, who plunges them, bulb down, into a vessel filled with water, kept constantly at 64 degrees. A standard thermometer attached to the inside of this vessel shows that the temperature of the water is correct. Another tiny scratch is put at 64.

Then a third workman plunges the bulbs into another vessel of water, kept constantly at 96. This is marked like the others, and the tube is now supplied with these guide-marks, each 32 degrees from the next. A small tab is then attached to each tube, on which its number is written, for owing to unavoidable variations in the bore of the tube each one varies slightly from the other.

With its individuality thus established the tube now goes into the hands of a marker, who fits its bulb and hook into the frame it is to occupy, and makes slight scratches on the frame, corresponding to 32, 64 and 96 degree marks on the tube. The frame is given a number corresponding with the number of the tube, and the tube is laid away in a rack amid thousands of others.

Marking Off the Degrees.

The frame, whether it be wood, tin or brass, goes to the gauging room, where it is laid upon a steeply-sloping table, exactly in the position marked for a thermometer of that size. The 32, 64 and 96 degree marks must correspond with the marks upon the table; if they do not the error in marking is instantly detected, and the frame is sent back for correction.

A long, straight bar of wood or metal extends diagonally across the table, from the lower right-hand corner to the upper left-hand corner. On the right this works upon a pivot, and on the left it rests in a rachet, which lets it ascend or descend only one notch at a time. That notch marks the exact distance of two degrees. With the three scratches already made for a basis the marker could hardly make a mistake in the degrees if he tried.

The marks made upon the frame or case are all made by hand with a geometric pen and India ink if the frame is of wood, and with steel dies if it is of metal.

The tube bearing the corresponding number is next attached to the frame, and the thermometer is ready for the market without further testing. Some makers use only two guide marks but the best makers use three.

In the process of manufacture the ordinary thermometer goes through the hands of 19 workmen, half of whom are often girls and women.

Some of the larger concerns in and near New York produce several hundred thousand instruments annually, and on every one of them the purchaser may see, if he looks closely, the tiny file scratch on the glass at 32, 64 and 96 degree marks—or somewhere near them, as different makers use different points.

WILLIAM DRYSDALE.

THE SOUND OF A LETTER.

It Made a Great Deal of Difference With a Musical Society.

Pearson's Weekly.]

Twenty years ago the energetic Prof. Schwarz was conducting a musical society. They were studying Mendelssohn's "Elijah" and had reached the chorus, "Hear us, Baal; hear, mighty god."

The men's voices were booming out sonorously, when the conductor cried out: "No! No! de dreadful vowel! Don't say B-a-l-e, soften a leetle—give de more musical sound, Bal—"

Whereupon the chorus took up the strain again: "Hear us Bawl—hear us Bawl!" but they quickly realized the peculiar fitness of the sentiment, and broke down in laughter, to the great amazement of the little German, who never saw the joke, but who returned reluctantly to the old pronunciation.