WEATHER GAUGES.

THERMOMETERS ARE MANUFACTURED WITH GREAT CARE.

They Are Made Very Accurately, and, Though Quickly, Pass Through Nineteen Pairs of Hands—The Different Processes of the Instruments.

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 recompared 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 cheaper. The alcohol is colored red with an aniline dye which does not fade.

The thermometer maker buys his glass tubes in long strips from the glass factories. The glassblower on the premises cuts these tubes to the proper lengths, and with his gas jet and blowpipe makes the bulb on the lower end. The bulbs are then filled with colored alcohol, and the tubes stand for twenty-four 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.

MARKING THE TUBES.

The tubes now rest until some hundreds of them, perhaps thousands, are ready. Then the process of gauging begins. There are no marks whatever on the tube, and the first guide mark to be made is the freezing point, 32 degs. Fahrenheit. This is found by plunging the bulbs into melting snow. No other thermometer is needed 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 particles, which answer the purpose as well as snow.

When the bulbs have been long enough in the melting snow a workman takes them one by one from their icy bath, seizing each 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 on each, now go into the hands of another workman, who plunges them, bulb down, into a vessel filled with water kept constantly at 64 degs. A standard thermometer attached to the inside of this vessel shows that the temperature of the water is correct. Another tiny file 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 degs. 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 others.

MARKING THE CASES.

With its individuality thus established the tube 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 the 32, 64 and 96 degree marks on the tube. The frame has a number corresponding with the number of the tube, and the tube is laid away in a rack amid thousands.

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 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 ratchet, which lets it ascend or descend only one notch at a time. That notch marks the exact distance of 2 degs. 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 nineteen 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.—New York Sun.

A Clever Collie.

T. Sidney Cooper, the English animal painter, says that he often made valuable studies in Cumberland at places where Scotch drovers halted with their cattle for the night. On such occasions he often had a chance to see illustrations of an animal's intelligence as well as of its physical perfection.

One day when there was a pouring rain a man consented to sit for me at the inn where I was staying. He brought his collie with him and both of them were dripping wet, so he put off his plaid and laid it on the floor by the dog.

I made a very successful sketch of the man, but before I had finished it the dog grew fidgety with the wet plaid, and his master said, "Tak' it awa' mon; tak' it awa'!"

The dog took the end of it between his teeth and dragged it out of the room.

After I had finished the drover's portrait I asked him if he thought his dog would lie quiet for a time, as I wished to sketch him.

"Oh, yes, mon," he answered, "he'll do anything I say to him. Watch! Watch!" he called, and then "whustled" for him, as the Scotch say.

As the dog did not appear we went together to look for him, and found him sitting before the kitchen fire with the end of the plaid in his mouth, holding it up to dry. I expressed my admiration of his intelligence, and the master replied:

"Ah, he's a canny creature, sir! He knows a mony things, does that dog, sir. But come awa', mon; the gentleman wants to mak' your picture."

So we returned to my room, and the handsome collie sat for his portrait.—Chicago News.

Mrs. Astor's Lingerie.

The cedar chests in the Astor mansion which contain the superb underwear of the queenly Mrs. Astor are perfect household ornaments in themselves, with deep engraven gold lockers with the initial "A" wrought in finest carving upon its surface. Inside the chest, neatly folded in webs of choicest linen, are the dainty garments of society's queen. Each week, as they leave the ironing sheet, they are laid within the chests to await the bidding of the owner. Every article of this superb wardrobe is stitched by hand, and no materials but the purest and finest of linens and cambrics are used. They are all elaborately trimmed with lovely point and duchesse laces, and the initial "A" is daintily embroidered on every article.

In the same orderly manner Mrs. Astor arranges her footwear, which is equally as exquisite; only the cedar chests have apartments molded in which each slipper and boot fits perfectly and keeps its shape.

By the way, Mrs. Astor has a very pretty foot for an old lady. Her ankles are small and shapely and her toes are extremely narrow. Her daughters, Mrs. Coleman Drayton and Mrs. Orme Wilson, have neither of them such pretty feet, and they are eternally envying their mother her beautiful feet and adornments.—New York Cor. Pittsburg Dispatch.

Charles Dickens and the Dog.

"Every one remembers Dan Brosnahan, the old sexton of St. Patrick's," said Mr. H. A. Preston. "Dan had a little dog, a homely cur, with the most plebeian blood in his veins, but a remarkably clever animal. He would follow the sexton everywhere, and the only way to restrain him was behind closed doors. One night about twenty-three years ago Charles Dickens gave a reading in Carroll hall. Dan was on hand to look after the hall, rigged in a dress coat out of deference to the great occasion. He had forgotten the dog, but the dog was on hand.

"In one of his readings the great novelist came to this passage, 'Bow-wow-wow," barked the little dog.' He gave it a realistic rendering, and almost with his words came a responsive and lifelike echo, 'Bow-wow-wow.' There stood Dan's little yellow cur, directly in front of Chief Justice Chase, and before the great men of the nation, mocking their guest. Dan dragged the dog out, terribly mortified, but Dickens said it was one of the finest compliments he ever received."—Washington Post.

No Excuse for Late Hours.

There would seem to be no excuse for the late hours which society prescribes for its ceremonies. Late evening parties for children are admitted to be injurious. But we are all children or ought to be, so far as the laws of health are concerned. We do not, as many think, by age earn a right to violate the laws of health. Nature takes pay for it in one way or another.

One difficulty at the foundation of our social life is that we do not admit amusements as necessary to our lives. We do not set apart time for them, but insist, if forced into them by fashion, upon taking them out of time that ought to be given to rest of mind and body. The day must all be given to business, up to its latest available hour, and then we take from hours that should be given to sleep time for social duties.—New York Ledger.

Glacier Ice.

Glacier ice is not like the solid blue ice on the surface of the water, but consists of granules joined together by an intricate network of capillary water filled fissures. In exposed sections and upon the surface of the ice can be observed "veined" or "banded" structure veins of a denser blue color alternating with those of a lighter shade containing air bubbles. The cause of this peculiar structure has been the subject of much theorizing among investigators, but hitherto the greatest authorities consider that the explanation of the phenomenon is yet wanting.—Goldthwaite's Geographical Magazine.

Which She Was.

Neighbor (on the street)—Good morning, my little dear. I never can tell you and your sister apart. Which of the twins are you?

Little Dear—I's the one w'at's out walkin.—Good News.

A WRECKING TRAIN.

HOW RAILROADS OPEN THE LINE AFTER AN ACCIDENT.

The Train Is Made Up of a Locomotive, a Derrick Car, a Box Car with Heavy Appliances, and a Tool Car—These Cars Contain Everything Needful.

"Accident to train No. 16, engine 46. Engineer A. Jones, Conductor L. Watson."

It is a dispach like the above that the superintendent of a railroad dreads most. He may have provided a most careful system of signals, may have perfectly trustworthy trainmen and competent switchmen; yet, despite all this, smashups will occur, trains will collide, tracks will be blocked and traffic stopped sometimes for hours over his busiest line.

It is to prevent the stoppage of business that every railroad keeps on hand several wrecking trains which are ready at a moment's notice to go to any part of the system, clear away wrecks, temporarily repair tracks and to put engines and cars in sufficient good order to reach the repair shops.

The moment a wreck occurs the telegraph operator at the nearest station sends a dispatch like the one above, followed by numbered answers to the following questions, which are copied on a blank at the superintendent's office:

1. Place of accident?
2. What caused it?
3. Were any persons injured? If so, what persons and to what extent?
4. Is main track obstructed?
5. Is the track or roadbed much damaged?
6. Is a side track near the obstruction which can be used to pass trains around?
7. Will section force be sufficient to clear obstruction? If not, how much greater force is wanted?
8. How long will it take to clear the track so trains can pass?
9. Is engine off the track or damaged? What position is engine in?
10. How many cars are broken or off the track?
11. How many cars are wanted, and what kind, to transfer freight in?
12. How many car trucks are needed?
13. Remarks of any nature concerning the accident.

This is made out in full and signed by the conductor.

HOW AN ACCIDENT IS REPORTED.

Supposing it was a freight train that was wrecked. It is bound west, and on account of a broken rail the train was thrown from the track, and several box cars and "flats" were piled up on both tracks. The conductor would fill out the blank, and when received by the superintendent would read something like the following: Engine 46—Engineer, Jones; conductor, Watson; 1, near Brownville; 2, broken rail; 3, none; 4, yes; 5, yes; 6, no; 7, wrecking train; 8, five or six hours; 9, yes, slightly; 10, seven; 11, five; 12, four; 13, approach on southbound track.

As soon as this dispatch arrives at the office a spare engine is attached to the wrecking train, a gang of men are hastily put aboard, the conductor gives the signal and the train speeds away to the scene of the disaster.

The train is made up of three cars, the first a flat car with a small and powerful derrick and a few spare car trucks. Next behind comes a box car well loaded with blocking, which is of value as temporary foundation for cars whose trucks have been smashed or torn from under them. In the same car is an ample supply of large and small hawsers, chains and canvas covers to protect perishable freight from rain and snow.

The tool car is last, and this indeed is a most interesting one. Some are divided into two or three rooms by partitions running from side to side at different points in the interior. In the center compartment of a three room tool car, where the wreckers remain when in transit, is a cooking stove and all utensils connected with a range, and hard by is a small pantry in which is stored a big supply of canned meats, coffee and utensils to prepare a hearty meal. Adjoining is the foreman's room with desk and all material for writing and the keeping of reports, telegraph machines, batteries and electrical supplies.

The latter supply comes in handy at the wreck. Wires are carried up from the car top to one of the railroad wires, connected, and the force is in communication with the whole railroad system.

A COMPLETE EQUIPMENT.

Everything which experience has suggested as likely to be brought into use in removing derailed cars and freight is to be found in these rooms. Along the sides are a score or more "jacks," some of them so powerful that a single man can lift to a height of several inches anything weighing from 1,000 pounds to twenty tons; there are also wrenches, rope, lanterns, axes, saws, hammers, light and heavy; crowbars, torches, drills, hatchets and numerous other appliances. Some new appliance is being added every time the train goes out, and all new things introduced in the work are added as soon as they are out.

It is very seldom that any tool is called for during the work upon a smashup that is not to be found in the resources of the car, all of which are accounted for by a man who keeps a record of every piece taken out and returned.

Upon the arrival of the train at the wreck the men are put to work in charge of an experienced mechanic and foreman. With startling rapidity the wreck is straightened out. The locomotive attached to the train is available to furnish power in case any hauling is to be done, and if the engine of the wrecked train is unharmed and on the "steel," it, too, can be brought into similar use.

In the handling of costly passenger coaches careful work is required; while in the case of overturned locomotives, which weigh from thirty-five to eighty tons, the work of righting and replacing them on the tracks is no small job.

Oftentimes a few hundred dollars will cover all damages for what looks to a novice like a wreck involving a loss of thousands of dollars. In most cases wrecked coaches and freight cars can be repaired at a comparatively small expense. Locomotives can also be smashed on the exterior to quite an extent without costly or irreparable damage.—New York World.

HOW WING LEARNED.

Dainty Flora, Just Home from School, Tried to Teach the Willing Coolie.

Our charming, dainty little Flora had just retured from her eastern "finishing school" and had fetched a great many ideas of elegance in her wise little head.

"Mamma, why do you not have Wing attend the door instead of the housemaid?" she said. "I think it much nicer to have a man when we can just as well."

"Because he cannot be taught," said mamma. "Jessie does it very nicely."

"Why, I am sure I can teach him," said the all important.

"Very well—you may," said wise mamma, quietly. Wing was immediately put into training. The whole matter was first explained to him; then Miss Flora took a card at haphazard from the hall table, went outside and rang the bell. Wing opened the door just a little crack and peeked cautiously out. N. B. This is the way they all do. He was instructed to open it farther. Being Miss Flora, and not a stranger, he complied and opened it as far as she indicated, taking his bearings by the pattern of the hall carpet just how far this was. Then she presented the card, told him how to show her into the drawing room. This performance was gone through several times; the door was opened each time just exactly so far, as was indicated the first time. She was shown into the drawing room exactly in the same place, and after politely saluting the improvised guest, Wing returned with the card.

Little Lady Flora was delighted with her success, and thought some naughty, disrespectful things about old fogyism and the like. Wing was complimented and told that in the evening some gentlemen would call and he must do exactly as he had been shown. Wing was in earnest; he meant to do it or die, and put the card carefully up his sleeve. The fateful evening came. The doorbell rang. Fair Flora flew to the head of the stairs and listened. Wing came stealing carefully through the hall to the door and opened it a little crack.

"What you want?" he said to the party outside. "You got um ticket? You no come in you no got um ticket," he said firmly.

There was a little smothered sound of something outside the door.

Wing, waiting, held it just two inches open. In a couple of seconds, which seemed an hour to the little listening party crouching at the head of the stairs, two bits of white pasteboard were handed in from the outer darkness.

Wing held them up a moment, then said:

"You wait—I see um," and shut the door in their faces. He rushed hastily to the gaslight, drew the "lesson" card from some hidden depths of his raiment, compared the two new ones carefully with it, flew back and reopened the door.

"You no got um light ticket; you no come in here," he said, proud of having done exactly the right thing and of his having detected the bogus imitation counterfeit passport to the presence of the all beautiful, when to his astonishment she flew past him like a swift winged bird and opened that door with a sort of wild eyed despair and invited those pretenders with the forged "tickets" to enter her sacred presence! The matter was too deep for him; he retired disgusted to his kitchen, not to be again recalled.

Jessie now waits at the door.—Milwaukee Sentinel.

Where Tobacco Is Raised.

Lancaster county, it appears, still stands at the head of all the tobacco growing counties in the United States, with her 19,217,800 pounds grown in the season of 1889. Four other counties—Christian and Henderson, in Kentucky; Dane, in Wisconsin, and Pittsylvania county, in Virginia, grow over 10,000,000 each. There are seventeen other counties that grow from 5,000,000 to 10,000,000 pounds each. Lancaster county's product in 1889, as all know, was sold at exceedingly low prices—about the lowest in our history—and even then produced the growers $1,349,090. The nearest approach to this by any other individual county was $886,840 by Hartford county, Conn. The product of Lancaster county, in fact, fetched more money than that of the entire state of Connecticut or of Wisconsin or of New York and Massachusetts combined.—Philadelphia Ledger.

He Had Caught the Idea.

The teacher is suspicious of the influence that the new boy in school seems likely to exert over the rest of the class, and not without some reason.

She had been explaining how aquatic birds are provided with boatlike bodies so as to enable them to swim easily, and was testing the results of her efforts to impress the fact in the minds of her pupils.

"Now," she said, "who can tell me why the duck's body is formed as it is?"

"I kin," said the new boy, holding up his hand.

"Very well; you may give the reason."

"So's to have 'er all shipshape."—Detroit Free Press.

Requisites of a Pet.

What is required for an everyday pet is that it shall be beautiful and intelligent; that it shall neither be too large nor too delicate, and if a bird that it shall sing or talk—preferably both. The first two requirements will not go far to limit the choice. Beauty of form and harmony of color are the almost inseparable attributes of that physical perfection which the natural life of animals demands, and he would be a rash man who classed any of the more highly organized animals as "stupid" without trial.—London Spectator.

Too Bad.

Soso (in the front row at the theater)—How dazzlingly beautiful Mlle. Highkicker's teeth look tonight.

Dr. Dentelle—They ought to; I spent all day cleaning and polishing them.

Soso—It must have tired her dreadfully.

Dr. Dentelle—Not at all. She sent them by her maid.—Kate Field's Washington.