other map producers of that country equal or have nearly attained to the same effective results.

Our own commercial map houses are making encouraging progress in the quality of their work, but the maps they give us will show better results if they set before them the highest standards as something to be finally attained. We have much to learn and many processes to revise before our ordinary map products become really good. One trouble is that those who order map plates usually want them in a great hurry; good or bad, they must be delivered in a few weeks. Then, many of our map makers have not learned how to generalize on their small atlas sheets the information contained on large-scale surveys; and the result is that they benefit little, for example, by the splendid topographic sheets issued by our government. There are not a few other weaknesses in our methods that help to give commonplace results, but some improvement is evident from year to year.

The public soon throws a book aside that is ignorant and untrustworthy. It would help map making along if the public were to reject every map sheet that demonstrates its unfitness by leading us constantly astray; and there are thousands of them, even in our schools, that do this very thing.—New York Sun.

THE BRITISH ADMIRALTY'S REPORT OF THE TUBULAR BOILER.

THE British Admiralty Committee, which has been engaged for the past four years upon the subject of cylindrical tubular boilers, has published its final report. Prolonged trials with various types of the latter class of steam generators have been carried out upon three vessels. In this report the committee reiterate the decision which they published in their interim report in May, 1902, the gist of which was published in the SCIENTIFIC AMERICAN, in which they expressed the opinion that it is undesirable to fit any more Belleville boilers in the navy. There is thus every probability of this type of water-tube boiler being entirely discarded. In their interim report the committee pronounced that there were four types of water-tube boilers which were sufficiently promising to justify their use in combination with cylindrical boilers. These were the Babcock & Wilcox, Dürr, Niclausse, and the Yarrow large tube. Since then severe and protracted experiments have been made with these four types, and now they announce that two of these boilers, the Babcock & Wilcox, and the Yarrow large tube, are satisfactory, and are suitable for use in large battleships and cruisers exclusive of combination with the cylindrical boilers. The committee has not discovered which of these two types is superior, as each has several particular advantages, and only long experience will determine which is the best all-round and serviceable boiler. The committee state that the up-keep of any type of water-tube boiler is heavier than that of cylindricals, but they state that they are of opinion that the two they have enumerated will prove less costly to maintain than any others that have been under their observation.

THE CONSTRUCTION OF AN INDICATING OR RECORDING TIN PLATE ANEROID BAROMETER.*

By N. MONROE HOPKINS, Ph.D.

HAVING designed and constructed a very successful aneroid barometer out of simple tin plates, for use in reading gas volumes, etc., in the physical and chemical laboratory, it occurred to the writer in view of the exceedingly simple construction, that others might be interested in such an instrument. The barometer finds equal use of course in the home as a forecaster of storm, if the principles upon which it is dependent are properly appreciated and understood. For a full discussion of the barometer and its place in weather forecasting the reader is referred to any good work on the barometer, or standard book on meteorology, the present article dealing only with the construction of the apparatus.

Fig. 1 shows the style of instrument first made by the writer, and which has proven exceedingly reliable. In this barometer twelve tin plates are used, forming six air-tight chambers made by soldering around the edges two of the plates, leaving a little puncture at the top as will be described in detail later. These six chambers when exhausted of the air which they contain, impart to a slender wooden pointer, thirty-six inches long, a movement over a scale of about twelve inches when the barometric pressure changes to a marked extent, as it does frequently upon the approach of a storm. In other words, when an ordinary mercury barometer falls two inches, the pointer of this particular instrument will travel about twelve inches over the scale. The instrument can be made even more sensitive than this by increasing the number of plates, or tin chambers in the chain, although six of these chambers or drums will prove amply sensitive for all practical purposes where an open scale is required, as in the case of reading gas volumes, and in weather forecasting. For such work as comparing and reducing gas volumes to a standard condition, it will be necessary to first compare and calibrate the aneroid with an ordinary mercury instrument.

Let us take up this particular barometer in detail,

and set down the directions for its construction. The moving part consists of a brass lever of the shape indicated in the drawing, cut from brass $\frac{1}{8}$ inch thick by means of a hack saw, and smoothed up with a flat file. The bearing upon which this lever turns is made by drilling a small hole in the center of its heavy end, which receives a short piece of tiny brass tubing, to be soldered in truly at right angles. At a distance of $\frac{1}{4}$ inch from this little bearing tube, a piece of $\frac{1}{8}$ -inch

Fig. 1.—Front and Side Views of Sensitive Indicating Tin Plate Barometer. The Six Plates Hung in "Series" Produce a Movement in the Pointer of 12 Inches Over the Scale when the Barometric Pressure Changes from High to Low, as it Frequently does Before a Storm.

steel rod is tightly screwed in, from which the tin plate chambers hang. A second hole may be provided at a little greater distance and be equipped with threads also into which the little pin may be screwed in case it is wished to make the barometer less sensitive. At the extreme right of the lever, which is about five inches long, a small hole is drilled from which the weight hangs. This weight must be adjusted to the particular barometer for which it is intended, and should therefore consist of a brass tube with the lower end closed into which shot or melted lead may be poured until the instrument is properly

Fig. 2.—Diagram of Tin Plate Best Suited to the Construction of a Barometer.

balanced. As plates come in different thicknesses of tin, etc., no set rule can be given for determining this weight, and it must therefore be made by trial. The steel pin which enters and supports the lever from behind, comes out from a little brass plate at the back into which it is firmly screwed, the little brass plate being in turn screwed to the wooden support.

As this portion of the barometer is so very simple it will not be necessary to dwell upon it at length, except to state that a knife edge support, which is a

little more elaborate, makes even a more sensitive and better instrument. An idea of this knife edge support can be had by a glance at the recording barometer. In this case, in place of the little sleeve bearing and steel rod, a knife edge and hard steel support are substituted, and the writer recommends this style of construction as being best.

The wooden pointer is made from $\frac{1}{4}$ -inch pine tapered to a slender point both ways, that is to say in

Fig. 3.—Method of Ascertaining Whether or Not a Tin Plate Chamber has been Hermetically Soldered.

breadth and thickness. It is attached to the upper lug of the little brass lever by brass bolts which pass right through the wood, securing it firmly to the brass on turning down the nuts.

The wooden frame and support may be cut from pine wood $\frac{3}{4}$ inch thick and be mounted upon a heavy base board by means of screws and brass angles. This woodwork should be planed, sandpapered and neatly shellacked with orange shellac in alcohol, for appearance. The total height of this wooden upright should be fifty inches, and its width at the base eleven inches, with a rectangular opening at the bottom of at least seven by ten inches if six-inch plates are to be employed. Of course these directions are only general in character as the type of instrument and plan of making allow of considerable margin. Fig. 2 indicates an efficient shape of tin plate to buy, and is sold for making pies. The accompanying figure is drawn to scale, and represents the proportions of the plate used in the barometers described, although any plate closely approaching this should answer equally well.

These plates cost three cents apiece, so it will be seen that the principal part of the barometer is not very costly, and it is recommended that a few more plates than are actually needed be purchased for purposes of experiment in soldering, etc.

The first step in the making of the exhausted chambers from the plates consists in accurately finding the centers for the hooks, which are conveniently bought at hardware stores, and which are known as cup

Fig. 4.—Scheme of Producing Vacuum and of Soldering up the Tin Plate Chamber.

hooks. The smaller size serves best for our purpose. These little hooks must be placed exactly in the centers of the plates, for otherwise the chambers would not hang horizontally, which would greatly mar the appearance of the furnished instrument. To get the centers of a number of plates it will pay to strike out from cardboard a disk with compasses of such a size as to fit closely into the plate. The center of the compass will then afford a place for the punch with which a small hole is made to receive the screw of the

* Specially prepared for the SCIENTIFIC AMERICAN SUPPLEMENT.

hook. These little hooks are screwed in as far as they will go, and are then carefully soldered airtight from the inside. It is also very important to cut off the projecting end of the screw, for it would defeat the object of the barometer to have them meet and touch within the chamber. Be absolutely sure the hooks are soldered in airtight before soldering the two plates

Fig. 4 illustrates the final step in the making of the air-tight chambers. The little puncture is treated with a solution of zinc chloride after brightening up with a file, and is tinned with solder. A little tin disk about the size of a dime is cut out as a cover and is also treated with the soldering salt and tinned. The chamber, with the little hole uncovered, is now

higher vacuum by putting about a teaspoonful of water within the chamber, and boiling it off, and soldering up the little puncture while the steam is issuing. With this plan the steam drives out practically all the air, and when the steam condenses upon cooling, it leaves a very perfect vacuum. There are two objections to this method. In the first place the tin chambers are likely to be crushed out of shape by the great pres-

Fig. 5.—View of Simple Indicating Tin Plate Barometer. This Instrument is About as Sensitive as the Ordinary Mercury Barometer, and is Provided with a Scale About 3 Inches Long.

necessary for a chamber, around the edges, as it will be too late to do this neatly after the chamber is made with a leak about the hook.

Fig. 3 indicates how the plates forming the chamber are tested for tightness after being soldered around the edges. Do not attempt to solder these chambers without first making a small puncture in the upper plate for the expanding air to escape from under the heat of the soldering iron. If this is neglected, the

rotated above the flame of a Bunsen burner or alcohol lamp and heated up as hot as possible without melting the solder on the edge. This is done to expand and drive out the contained air, when the little tin disk is slid over the puncture, and carefully soldered

sure of the atmosphere, as was the case in about four chambers out of five treated in this manner, and secondly the chambers are left with a little water on the inside, which in time will go through the tin and rust out the under iron, and in time might eat right through the chamber and put it out of commission. The objection to leaving a little air behind in the chamber, as must be the case with heating simply to

Fig. 10.—Detail of Knife Edge Support for the Recording Tin Plate Barometer.

Fig. 6.—End View of Simple Indicating Tin Plate Barometer, Showing Knife Edges and the Method of Mounting.

Fig. 7.—Detail of Knife Edge and the Method of Mounting in the Simple Tin Plate Barometer.

expanding air will blow through the fluid solder before it hardens, and leave minute holes. These little punctures if made with a punch must be smoothed down to the level of the plate, for they are to be covered with small disks of tin soldered on after exhausting. When the plate has been as carefully soldered as possible, and after a minute inspection, it is immersed in a vessel of water as shown, and an air pressure put upon the inside by means of a small blow

Fig. 9.—Front View of Recording Tin Plate Barometer. The Three Plates in "Series" Produce a Bold Movement Over the Revolving Scale and Leave a Permanent Record of the Atmospheric Pressure.

on airtight. While the little cover is being soldered on, the chamber is still kept heated. When the little cover has been properly placed and the surrounding solder has had time to solidify, the chamber may be withdrawn from the flame and allowed to cool. It

Fig. 11.—Back View of Recording Tin Plate Barometer. Here the Clock is Shown, which may be Belted to Drive the Revolving Disk at Any Predetermined Rate from One Revolution per Day to One Revolution per Month.

expand it, lies in the fact that the barometer will have a slight temperature error, but this has proven so small that it may for all practical purposes be neglected. All barometers have this small temperature error due to one cause or another, but fortunately it is so small as to be of no great moment.

It only remains to hang six such completed chambers in series in the recess made by cutting out the center of the supporting frame, as indicated in the first illustration. The bottom plate is attached to a pin in a little brass block, and the hook of the upper plate is attached to a small turn-buckle, by means of which the pointer is brought to the center of the scale after attaching the counterweight. Fig. 5 illustrates a much simpler form of indicating barometer using only a single chamber. This instrument, of course, is much less sensitive, that is, has a much shorter swing to its pointer. The support for the chamber may be cut from heavy brass or wood, and is attached to a suitable baseboard. The pointer can be made any convenient length, only the longer the pointer, of course, the greater the range. The instrument illustrated is made entirely of wood with the exception of the tin chamber. Fig. 6 shows an end view of this barometer, making the method of supporting the knife edge clear. The wooden support is notched out, and two metal plates are screwed to either side upon

Fig. 8.—View of Single Tin Plate Barometer Made Sensitive by the Use of Multiplying Lever. The Pointer Moves Over a Scale About 12 Inches Long with Extreme Conditions of Barometric Pressure.

pipe provided with a rubber terminal to insure an airtight connection. If any bubbles appear around the edge, the entire success of the barometer depends upon their being detected, and the openings closed. Remember that these chambers are the all-important part of the barometer, and must be made absolutely airtight.

will be noticed in a few minutes, if the chamber has been closed perfectly airtight, that the tops and bottoms of each chamber take on a slightly concave shape from the pressure of the atmosphere without. It will be argued that the vacuum within, as a result of this process, will not be very high, but it serves admirably the purpose. The writer has made a much

which the knife edge rests. As pointed out in the description of the sensitive six-chamber barometer, the use of a knife edge support is by far the best, although a simple pin passing through will serve the purpose. When a simple pin support is employed, the index lags a trifle, and it is necessary to tap the barometer gently to get its true reading, for the friction of the common pin bearing causes the pointer to stick to a small extent. Fig. 7 illustrates the detail of the knife edge and the plan of mounting it. The knife edge is easily filed from a piece of good steel, and may be tempered by heating, and cooling suddenly in water or oil after shaping and sharpening. It is soldered truly into an opening in a small brass plate, which is bolted through the wooden pointer to a second brass plate also cut out to receive the knife. The two little shaded circular disks on the pointer to the right of the knife edge support are two small lead weights which run right through the pointer to act as a balance. Two or more may be required, but they must be added by trial after the completion of the barometer.

Fig. 8 illustrates a similar, simple single-chamber barometer, but provided with a multiplying lever to give a greater throw to the pointer. This instrument is provided with common pin bearings, as can be seen, but it may, of course, be equipped with knife edges if one is willing to undertake the additional work. A more elaborate system of compound levers may of course be added, thus increasing the range.

Fig. 9 illustrates a recording barometer easily made upon the same general plan, only in place of the usual scale a revolving plate is employed. This barometer may be made with any number of chambers, but for ink records three chambers appear to give the best results. The lever must be mounted upon a good knife edge, for there will be a little friction at the pen, which is so adjusted as to just touch the paper upon the revolving disk, and it is desirable to reduce all friction as much as possible. The amateur can learn more about weather forecasting by the use of such a recording instrument than in any other practical way, for it leaves the story behind for filing away with notes. Fig. 10 shows the detail of the support for the knife edge. It consists of a little piece of hard steel with a shallow groove filed into its upper side to receive the little hardened knife. The knife in the present instrument is truly soldered into the brass lever within an opening, as shown in Fig. 9. The support is soldered into the little plate near the lower right-hand corner in order that the plate may be in the center of the support. This makes the barometer look better balanced. Fig. 11 shows this recording barometer from the back, and illustrates the little shelf upon which the driving clock is placed. This clock is provided with a small wooden pulley with a groove into which is snapped a rather wide rubber band. This is done to provide a good friction surface for the driving belt. The revolving disk is equipped with a similar rubber band over which a belt of waxed string passes. The disk, which must be mounted upon a delicate bearing, insuring as much freedom from friction as possible, may be driven at any predetermined rate by simply varying the diameter of the large pulley. In the drawing the solid line represents the disk rigged for rapid turning, and the dotted line represents it for slow motion. The clock as here depicted is only a common twenty-four-hour timepiece, but it will be seen that any good eight-day clock may be substituted and the instrument may be elaborated in many other ways. The little pen at the top simply consists of a little piece of bent tin designed to hold a few drops of non-drying, glycerine recording ink. Now for a few words of final advice to those who have not had experience with barometers. When this instrument is properly completed and set up for observations (this statement applies to all the barometers described here) some of the readings will appear to the novice as being very erratic. It will take perhaps several weeks to get well acquainted with the meaning of the indications. Do not expect to become an infallible weather bureau at once! The writer also strongly advises the making of a common, straight-tube mercury barometer with which to compare the behavior of the aneroid. To do this procure from any dealer in chemical and physical glassware a thick glass tube about one-quarter inch internal diameter, and close one end by fusing in a blast lamp. Fill this with mercury as solidly as possible, that is as free from air bubbles as possible, and invert in a small vessel of mercury. The tube should be firmly supported in some way, and should be provided with two little paper collars which may be slid up and down, serving as indicators of minimum depression and maximum elevation. If the tin plate aneroid has been carefully made according to the directions herein given, the pointer will follow the motions of the mercury in the tube, only to a much more marked extent. By making such a comparison with a tube of mercury, the maker of the aneroid will be assured that his instrument is properly detecting and indicating or recording the true barometric conditions. The appearance of the barometer is greatly increased by nickel plating the chambers.

Unnumbered native Ohioans, not to speak of hundreds of thousands of residents of this State who have come from foreign lands and other States of the American Union, must have wondered why a fertile and productive tract in northern Ohio, a district which in no way hints the ravages of fire, should be called the "Firelands." Among all the vicissitudes of Ohio's early history great conflagrations were notable for their absence. No such terrible forest fires swept

this State as ravaged large areas in Michigan and Wisconsin seventy or eighty years later. The fires to which the name refers raged in Connecticut, not Ohio, and they were the work of British and Tory soldiers, instead of the result of accidents or natural causes. In 1781, when the long struggle for independence was nearly ended, Benedict Arnold commanded an expedition which ravaged the Connecticut coast of Long Island Sound. He burned New London and other towns and left behind misery and destitution, as well as a more bitter hatred than he had earned before that outrage upon his native State. This and other cruel and senseless attacks upon Connecticut towns left so strong a feeling of sympathy and injustice behind that in disposing of Connecticut's rights in lands now forming part of Ohio, 781 square miles in the extreme western edge of the Western Reserve were set apart to be donated to sufferers by the British raids. Five ranges of townships running north and south were included in this tract. Sandusky Bay and Lake Erie extend so far southward at this point that the five ranges of townships contained only about 500,000 acres of land. The tract measured some 27 miles by 30. The Connecticut sufferers from the torch of the enemy lived chiefly in New London, Norwalk, and Fairfield, and it was from those towns that many of the settlers of the "Firelands" came to build in the Ohio wilderness settlements bearing the same names and having like civic ideals and character. —Dayton Herald.

SNAILERIES.

THE rearing of snails as a food-product is by no means a new industry, and it is to-day carried on in various European countries, especially in France and Italy. Many species are regarded as edible, but the large white snail (*Helix pomatia*) seems to be the snail that is generally preferred. The Romans reared this species in enormous quantities in gardens or inclosures, banked or surrounded with ashes and sawdust, so that the snails could not get out, feeding them on bran and sordid wine. The snaileries are said by Pliny to have been invented by Fulvius Herpinus some time before the civil wars between Cæsar and Pompey; and from another Latin author, Varro, we learn all about snail-stews and how to make them. It is from the Roman period that snails as delicacies have descended to us. According to Varro, the Romans also grew their snails so large that the shells of some would hold ten quarts!

Besides rearing these wonderful snails in *cochlearia*, they also drew supplies from Capri, Sicily, and the Balearic Isles, as we learn that from these places came the snails that were most prized in the Roman market. The Romans further acclimatized this gastropod, and spread their taste for it, in all the provinces they conquered, Gaul or France retaining the taste to this day.

The *Helix pomatia* is in England an introduced and not a native snail, and is called the Roman snail, because it is generally supposed to have been brought here by the Romans, though tradition has it that it was first introduced by monks into Cambridgeshire, and also that it was introduced into Surrey—where it is known as the Italian snail—by one of the Countesses of Arundel. The *Helix pomatia*, however, whether introduced or not, is now found from Finland to Lombardy.

All edible snails are nocturnal hermaphrodites, and belong to a family which are distinguished into three groups: sea, fresh-water, and land snails. Our interest at present lies with the last-named. Besides *Helix pomatia*, the other snails that are used as food are *Helix aspersa* (the common garden-snail) and *Helix nemoralis* (the wood-snail). In the Midi of France they prefer *Helix vermiculata*, *H. aperta*, and *H. pisana*; in Italy they eat *H. lucorum*; and the edible snail in Mexico is *H. buffoniana*. In the United States edible snails are frequently to be seen exposed for sale; but they are not raised in that country, and those on sale have been shipped to America alive from Europe. In Vienna, again, during Lent there is a large snail-market, the snails coming in barrels from Swabia. The great center for the consumption of snails, however, is Paris and some of the French provinces. There is, indeed, a very large trade in this commodity in France, the large white snail being in special demand in Paris, while the garden and wood snails are in common use among poorer consumers in all parts of France. Snails are a recognized dish in French menus, and the *maitre d'hôtel* can serve you snails à la Cettoise, or *Marseillaise*, or *Parisienne*; or *Bourguignonne*, or *Bordelaise*, all being excellent ways of disguising the snail. For example, if we take the last-named, *Bordelaise*, it is simply a combination of snails, red wine, butter, and garlic. Frenchmen also take snails medicinally for phthisis and catarrhal troubles, preference being given to preparations made from or with raw and uncooked snails. Under the name of *hélicine*, a powder is also sold in France which is said to have absorbed the juice of the snail.

It must be confessed that snails by themselves make a very insipid dish, but this is relieved by the strong condiments that are generally used; yet owing to their glutinous nature, snails still remain a difficult morsel to digest—that is, if the condiments used do not excite the secretion of gastric juice. They should generally be consumed immediately after they are gathered, after having been purged of all noxious vegetable substances that they may contain. Instances of poisoning have been known to occur when

the snails were picked off henbane, belladonna, and other plants of like nature; but accidents of this kind are avoided when snails so gathered are first subjected, as is the usual custom, to a lengthened period of fasting before being used.

The production of snails in France is now not equal to the demand, and large quantities are yearly imported from Italy, Switzerland, and Germany. During the Paris Exhibition of 1900 there was such a scarcity of snails in the Paris market that at one time prices rose as high as fifty-five francs per thousand. The wholesale trade in snails in Paris is carried on in Pavilions Nos. 9 and 11 of the Halles Centrales, and here from sixty to eighty millions of snails are received yearly. Commercially, only two kinds of snails are known, the one called *gros blanc* (large white) or *escargot de Bourgogne*, and the other *petit gris* (the small gray).

In this snail market there are two seasons, called respectively *coureurs* and *bouchés*. In the first period, which extends from 15th April to the end of May, *gros blanc* sells at from eight to ten francs per thousand, and *petit gris* from two to three francs. The second period is divided into two; the first, called *voilés*, extends from 1st September to 15th October, the price for *gros blanc* ranging from twelve to fourteen francs, and for *petit gris* about four francs; the second is the *bouchés* proper, extending from 15th October to April, and in it prices average about eight francs for *gros blanc* and five francs for *petit gris* per thousand.

The snails that are sold in the period of *bouchés* have generally been kept in snaileries (*escargotières*), where at the first frost they inter themselves about ten to fifteen centimeters deep, and secrete a slime, which, mixed with the earth, forms a cement. The snails sold during the *voilés* period are those which have not been placed in preserves after being picked up, but have been simply shut up in pens, where through want of nourishment or from unnatural conditions they have only formed at the entrance to the shell a simple veil of slime.

Snails, as has already been noted, are nocturnal in their habits, moving about and eating during the night, especially so during the rains of spring. In the period known as *coureurs* they are gathered on dewy mornings or after heavy showers; consequently when there is a wet spring enormous quantities come to hand in the markets of Paris. It may be added that they are "moist goods" to handle, and therefore become easily heated, and deteriorate in three or four days. It is during this season that they are sold in the streets of Paris from small carts. The snails that are dispatched to the Halles Centrales are packed in cases, baskets, or sacks containing from five hundred to two thousand each, the cases being pierced with holes for aeration. With respect to the snails that come to hand in the *voilés* and *bouchés* period, these are generally sold by private contract to grocers, pork-butchers, wine-sellers and restaurant-keepers, who prepare them and sell them to consumers.

Independently of Italy, Switzerland, and Germany, the Parisian supplies of *gros blanc* are principally drawn from Somme, Aisne, Sarthe, Seine-Inférieure, Limousin, Savoy, and Auvergne. The snail crop or harvest in these regions principally comes in as *coureurs*, but an important quantity is also received as *bouchés*. The supplies of *petit gris* are drawn from Manche, Calvados, Pas-de-Calais, Charente, Vaucluse, and Deux-Sèvres, and come almost entirely as *bouchés*, being forwarded in cases or baskets or in kegs.

The collecting of the snails is carried on in the provinces all day long by men, women, and children, who with iron hooks search for them at the foot of thorn-hedges and under ivy, and in winter in old walls. If lucky, a good searcher will collect from one thousand to fifteen hundred snails. These are paid for according to their weight, about a thousand snails averaging ten kilogrammes, and the payment varies with the prices current in the Paris market, but it usually ranges from twenty to forty centimes per kilo. This work, therefore, cannot be said to be well paid. The result of allowing children to collect them has been that they pick up and bring in snails that are unsalable, and as these are thrown away, broken, or in other ways made useless, the snail-population of the country, through the loss of immature young, is rapidly decreasing.

Generally the slack time in the snail market is during May and June, when the collectors endeavor to restrict their collections so as to place more on the market in August and September. In some cases, instead of being sent to market the snails gathered are held in reserve by being kept in snail preserves or gardens. The size of these snaileries, or, as the French term them, *parcs à escargots* (snails' pens), varies greatly according to the number of snails they are intended to stock. In these pens are a number of shelters about two meters long and one meter broad, and each of them looks like a wooden roof laid on a bed of soil having a slight slant. They are so placed that round about each of them food for the snails may be grown, and every morning the keeper has to pick up and replace the snails that have wandered about during the night in search of food.

Snail gathering and preserving does not seem to be at all profitable, and curiously enough we now find many French authorities expressing the opinion that snails, as an edible commodity, trade a good deal on their ancient fame. Only last year, according to *Le Journal d'Agriculture Pratique*, the ques-