

## "FARMERS' ROADS."

A MATTER OF IMPORTANCE TO TILLERS OF THE SOIL.

United States Department of Agriculture Takes It Up—Macadam and Telford Systems—Model North Carolina Roads.

THE United States Department of Agriculture has taken up the matter of "farmers' roads," avers the Chicago Record, and Roy Stone, an engineer of the department, believes that farmers can build good roads without impoverishing themselves. On this subject Engineer Stone says:

"In the first place the road that will best suit the needs of the farmer must not be too costly; in the second place it must be of the very best kind, for the farmer should be able to do his heavy hauling over it when his fields are too wet to work and his teams are free. The road that would seem to fill the farmer's need, all things considered, is a solid, well-bedded stone road, so narrow as to be only a single track, but having an earth track alongside.

"A fine, dry, smooth dirt track is the perfection of roads; it is easy on the horses' feet and legs, easy on the vehicle and free from noise and jar. It holds snow better than gravel or stone and requires less snow to make sleighing, and where such a road has a stone road alongside to take the travel in wet weather it will suffer hardly any appreciable wear.

"The stone road, on the other hand, wears by the grinding of the wheels and the chipping of the horses' calks in dry weather more than in wet. If it can be saved this wear for an average of six months in each year, so much will be clear gain.

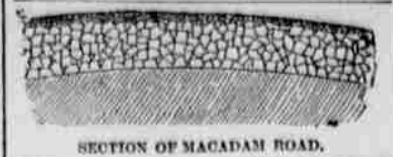
"The questions raised regarding this method of construction are: Can the junctions of the earth and stone sections of the road be kept even so as not to have a jog in passing from one to the other, and can the meeting and passing of loaded teams be provided for?"

Mr. Stone cited the condition of the Canandaigua (N. Y.) roads as evidence that there is no sign of division between the earth and stone, and added that those who use these roads say that no difficulty is found in the passing of teams, since practically no two teams ever turn out at exactly the same spot, and no rutting of the earth road occurs.

The League of American Wheelmen has taken up the cause of good roads, and men who are accustomed to feel the public pulse say that good roads will soon be a dominant issue in State

der a heavy roller until the earth is firm, compact and even.

On both sides of the roadway excavations are made for the drains. In the bottom of the ditch thus made tiling is laid, covered with hay, straw or some such filtering material, and



SECTION OF MACADAM ROAD.

over it is laid broken stone in such a manner that water will easily find its way down to the tile.

Sometimes, instead of tiling, bundles of rods or straight limbs of trees, bound together fagot fashion, are laid in the bottom of the drains instead of tiles. This is a cheaper construction, but is not regarded so good as the U-shaped tiling.

When the roadway has been graded and rolled and the drains have been built the first layer of broken stone is put on the rolled surface of the earth foundation. This layer is about six inches deep, and consists of broken stone, no piece too large to pass through a ring of two and one-half inches inside diameter.

When this layer is evenly spread over the foundation the roller is again brought into use, and the stone layer is rolled until it is firm and compact. The stone is sprinkled with water before the roller is passed over it, and sometimes clean, sharp sand is sprinkled over the stone.

The second layer, thick enough to bring the stone bed up to ten inches, is next spread on and rolled, and then a top layer of clean gravel or stone chippings is put on and rolled. Care is taken that the gravel shall not be waterworn, with smooth, round corners, for this is injurious to the roadway.

The Telford road differs materially from the macadam, for it has a foundation of stones laid down singly, with the broad side down, and the spaces between the stones filled with smaller, rough, wedge-shaped stones driven in solid.

Originally the Telford foundation was "convexed" by laying the largest stones to form the crown in the center of the roadway and then grading down to the gutters with smaller stones, but this practice is no longer followed, for the earth is graded to form the crown as it is done in a macadam road.

The earth foundation is well rolled and then the sub-pavement is laid on with the long side of the stone set transversely. Between these stone chips are packed firmly and then broken stone is placed over the sub-pavement in two layers, the first layer



A MECKLENBURG COUNTY (NORTH CAROLINA) ROAD.

and National politics. What bicycle riders are doing at present was done by the horseless vehicle men of England in 1831, when their agitation resulted in the appointment of a committee of the House of Commons "to inquire into and to report upon the proportion of tolls which ought to be imposed upon coaches and other vehicles propelled by steam or gas upon turnpike roads."

It was just about this time that James Macadam, Road Surveyor, and Thomas Telford, President of the Institution of Civil Engineers, with their adherents, were engaged in a controversy regarding the relative merits of "Macadam" and "Telford" roads.

Up to that time England's best roads were the remains of the old Roman roads, but Macadam and Telford began an era of road building, each after his own kind, which brought English roads to a high state of development and made those two engineers famous as the originators of the two systems which to-day bear their names.



SECTION OF TELFORD ROAD.

The macadam road has the earth graded and rolled for its foundation. The principles laid down by Macadam were as follows: It is the natural soil which really supports the weight of travel; while it is preserved in a dry state it will carry any weight without sinking. This native soil must previously be made quite dry and a covering as much impenetrable to rain as possible must then be placed over it to preserve it in that dry state. That the thickness of a road should only be regulated by the quantity of material necessary to form such impervious covering and never by any reference to its own power of carrying weight.

These principles, modified in some respects, govern the making of a macadam roadway to-day. The natural earth foundation is graded so that the curve of the foundation will be parallel to the curve of the surface of the roadway when completed. The earth foundation is rolled and re-rolled un-

being rolled and packed before the second is laid on.

This layer of broken stone forms the intermediate course, for the surface is made of stone broken in smaller pieces and packed under a light roller. Sand is swept over the surface and another rolling with a heavier roller completes the pavement. The sand is moistened and the rolling is continued until the sand can no longer be driven in between the broken stone. Drains are laid, as they are for macadam roads, before the sub-pavement is built.

A simple experiment, which can be made with any wheel, will show why a smooth, hard-surfaced road makes hauling easy for a horse. On such a road the roadway is tangent to the circumference of the wheel. The wheel stands on the immediate point of contact, and there is no obstacle over which the wheel must be lifted. On a sandy or loose, soft earth road the wheel sinks into the roadway. To draw the wheel forward the earth before its track must be displaced or passed over, so that a horse, in addition to the force it must exert to draw the load, must use extra force to overcome the obstacle in the path of the wheel.

In Mecklenburg County, North Carolina, the systematic improvement of roads has made progress for nearly fifteen years. The general plan adopted was to start at the city limits of the county seat and to grade and macadam all public roads from this point out toward the township and county limits. These roads have a width of forty feet for the first two miles from the city limits and beyond this point a width of thirty-six feet.

The average cost of these roads, including the macadamizing and grading, is about \$2000 a mile. The efficiency of the roads is shown by the illustration, copied from a photograph. The wagon loaded with twelve bales of cotton weighs 6000 pounds, and each of the other three wagons is loaded with a cord of wood.

Much of the road building in this county is done by convicts. The average number of convicts employed is about eighty, and the average cost of this labor per convict, including food, clothing, medical attention and guards, is from twenty to twenty-two cents a day.

The rate of taxation in the county

is eighteen cents on \$100 worth of property. In addition each township levies a tax varying from seven to fifteen cents on each \$100 worth of property. The law requires all able bodied citizens along the public roads to labor four days of each year on the public roads or to pay fifty cents a day in lieu thereof.

This class of labor is used independent of the convict labor, principally in the work of grading or in the general repairs of those roads or portions of them upon which the convict force is not engaged.

### STEAM-HEATING.

Recent Advance in This System of Warming Residences.

With its many early imperfections steam-heating was slow in coming into favor, and there are to-day many worthy persons who hold a rooted aversion to it, based upon unhappy experience. It is not difficult to understand the reason for this when one visits a building equipped with a steam-heating apparatus of a score or more years ago. The temperature is scarcely even bearable, for with the steam turned on the rooms become torrid; if it is turned off they become frigid, and there seems to be no happy medium. Added to this very vital objection, when the steam is first admitted to the radiators, one might as well live



PERSPECTIVE VIEW.

in a boiler-ship. The thumping and clanging is enough to craze a person of nervous susceptibilities.

In view of the splendid results that are now obtained in steam-heating, it is needless to say that these faults are not due to the system, but to the ignorant application of it. Where the heat cannot be properly and perfectly regulated there has been no scientific adjustment of heating surface to the cubic dimensions of the room. In many buildings that have been equipped with the apparatus, subsequent to their erection, there are hundreds of feet of steam pipe exposed, because it was impossible to carry them from floor to floor and from room to room within the walls. The radiators themselves have sufficient heating surface, while the steam pipes are responsible for the over-heating. The architect of to-day settles this difficulty in his plans. If the matter is left to him, steam-heating becomes a delight to the householder, as it gives sure and equable temperature in the utmost extreme weather, and at a minimum of cost for fuel.

The thumping in the radiators, which forms a prime objection to the system in the mind of those who remember the experimental stage of steam-heating, is entirely obviated by the use of improved apparatus. It is caused, of course, by the condensing of steam in the radiators, and when this water is properly conducted back into the boiler the system is as noiseless as hot air or hot water heating.

The accompanying design is for a country villa in which the plans call for a simple and inexpensive steam-heating plant.

General Dimensions: Width, through dining-room and back parlor, 33 ft. 6 ins.; depth, including bay window, 43 ft.

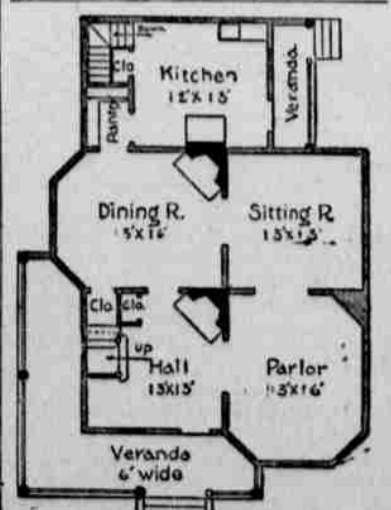
Heights of Stories: Cellar, 7 ft.; first story, 9 ft.; second story, 9 ft.

Exterior Materials: Foundation, stone; first and second stories, clapboards; band between first and second stories, band under eaves, gables, dormers and roofs, shingles.

Interior Finish: Two coat plaster, hard white finish. Flooring and trim in hall, oak; elsewhere, N. C. pine. Oak staircase. Kitchen walls wainscoted. All interior woodwork grain-filled and finished with hard oil varnish.

Colors: All clapboards, fawn brown. Trim, including water-table, corner boards, cornices, etc., white. Outside doors and ceiling, oiled. Shingles on side walls left natural for weather stain. Shingled roofs stained a deep red.

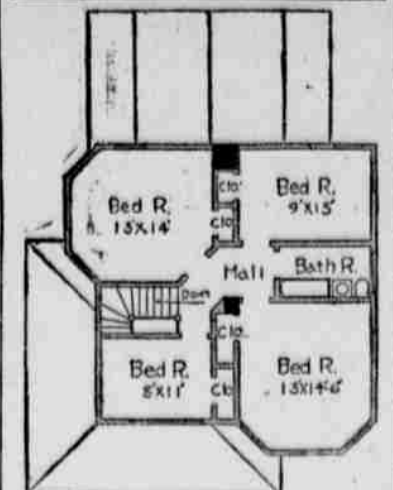
Accommodations: Cellar under rear



First Floor

half of house with inside and outside entrance. Portiere openings connect hall, parlor, sitting-room and dining-room. Open fireplaces in hall and dining-room. Hat and coat closet in hall. Butler's pantry, containing

dresser, connects kitchen and dining-room. Portable range and sink in kitchen. Bath-room in second story, with full plumbing. Attic unfinished, except for storage purposes.



Second Floor

This house would cost about \$2985—not including the heating apparatus, range and mantels—built within 100 miles of New York City, although in many sections of the country the cost should be much less, where labor or materials are cheaper.

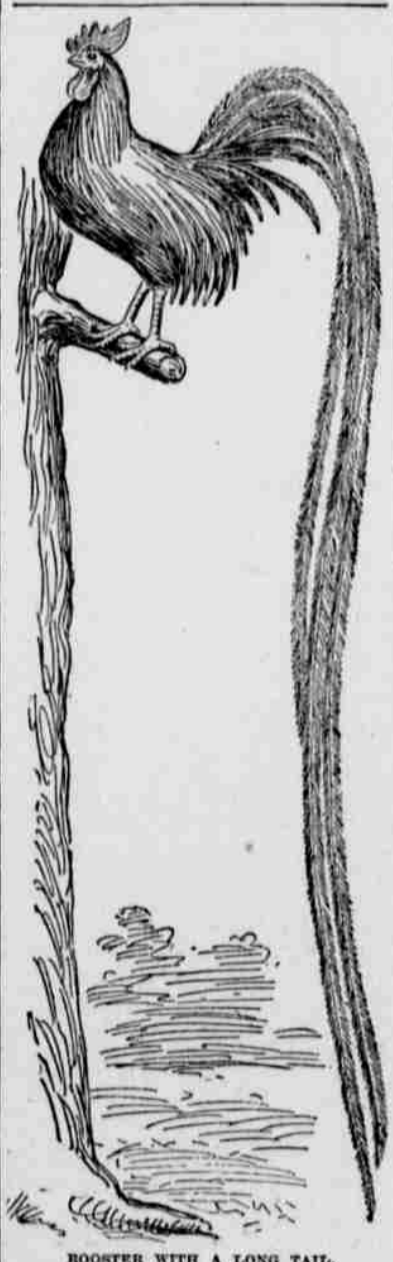
Radiators should be placed as near the windows as possible, and in all rooms but the kitchen, including the bath-room and lower hall. A fair estimate for the apparatus complete, set, would be about \$290.

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### A FEATHERED CURIOSITY.

It is a Rooster With a Sixteen Feet Long Tail.

The Japanese are a fun-loving people and they are as full of tricks of various kinds as an American school-boy. A writer who recently returned from Japan tells of a queer rooster he saw on the Mikado's Island. "The only thing in the shape of a live, physical freak that ever came under my observation was a common, everyday sort of a barndoor rooster," he says. "That rooster had a tail sixteen feet



ROOSTER WITH A LONG TAIL.

long and thought he was 'some pumpkins.' Nevertheless, he was a fraud, a snare and delusion. He strutted about with the self-complacent air of a peacock, notwithstanding that he must have been aware of the fact that his tail was composed of plumes begged, borrowed or stolen from the caudal appendages of other roosters. That tail certainly was a marvel of ingenuity. The feathers were so cleverly joined one to another as to defy detection, except on the minutest of scrutiny. Yet the owner of the bird could take off and put on that wonderful tail whenever it pleased him to do so."—Philadelphia Press.

### The Largest Dam.

The largest dammed body of water in the world will be secured by the building of a dam at Cloquet, Minn., on the St. Louis River, 900 feet long and eighty feet high, by which back water will be extended sixty miles.—Current Literature.

### Great Botanic Garden.

The botanic gardens of the Jardin des Plantes, Paris, includes about seventy acres. The plants are all labeled with red labels, medicinal; green for alimentary; yellow, for ornamental purposes; blue, for art, and black, for poisonous plants.—Current Literature.

## WOMAN'S WEAR.

STYLISH COMBINATIONS IN JACKETS AND WAISTS.

Handsome Outing Jacket of Light Gray Cloth—A Becoming Waist of Linen Batiste—New Ways of Wearing the Hair.

THE stylish combination portrayed in the first double-column engraving illustrates one of the newest fancies of the season. The open jacket is made of light gray cloth, the lapels and collar being faced with fine suiting in "shepherd's plaid" (black and white check) that matches the skirt with which it is worn. Smoked pearl buttons are used for decoration. The fronts are deeply faced and reversed to form long lapels that meet the rolling collar in notches. They are usually worn open, but can be closed at the bust if so desired. The back fits smoothly, side, back and

NEW WAYS OF DRESSING THE HAIR.  
With a return to the fashions of our grandmothers there is also a return to the elaborate mode of dressing the hair. The plain "knot" that anyone could do has given place to an elaborate structure of curls and waves and frizzes and flowers and jewels that only an artist can accomplish, and the reign of the hair dresser will soon begin in the land.

Speaking of the new coiffures, a noted French hair dresser says that for an evening toilet wearing the hair is only necessary; for morning it is indispensable. For day wear the knot is raised higher on the head than last year, while for evening wear it is raised quite up on the top of the head. In the pretty designs for a daytime coiffure given above the hair is simply waved all over the head and drawn back so that it forms bands at the sides. At the back it is drawn loosely into a knot well up on the head, where it is secured by a handsome tortoise shell comb.

For evening wear all sorts of hand-



STYLISH OUTING JACKET.

underarm gores, with a curved centre seam securing a trim adjustment. Plaits are laid underneath, below the waist line in back, to form the fullness now fashionable. The stylish gigot sleeves are shaped by single seams, the fullness at the top being laid in back and forward turning side plaits, that form single box plaits at the shoulder seams. The blazer can be made from one material in self-colored cloth or of suiting to match skirt. Pockets can be inserted in the fronts if desired, these being omitted from all the latest designs, inside breast pockets being inserted in the front facings that reach to the under arm and shoulder seam.

The quantity of material, 44 inches wide, required to make this jacket for a lady having a 36-inch bust measure is 3 1/2 yards.

### A BECOMING WAIST.

The stylish waist depicted in the second large illustration is one of the season's novelties, its soft fullness and handsome decoration making it unusually attractive and becoming. Ecu linen batiste is the material represented, made up over green taffeta linings and decorated with bands of batiste embroidery and green satin ribbon. The full fronts and back are joined in shoulder seams, and gathered in several rows of shirring around the neck and at the lower edges in centre. A full plaited basque of the trimming is sewed to the lower edges

some accessories, jewels, flowers, feathers, rosettes are worn, mixed with tufts of hair. To these are added aigrettes worn slightly at one side. The hair is very much puffed around the head and the waving gives it a pretty and airy effect. A stylish and new arrangement of the hair for an



FOR DAY AND DINNER WEAR.

elaborate dinner or theatre party is pictured here. It is composed in front of bands, which form waved festoons over the ears. Behind are rosettes of pink velvet, one upon another, forming an aigrette. Five curls fall over the shoulder at the back.

### WHITE STREWN WITH LILACS.

The new ribbons are wonderful in coloring and diversity of patterns. On white and bright-colored grounds



LADIES' WAIST.

in centre. The standing collar has a plaited frill standing out from its upper edge that separates in points at front and back. Three bands of batiste embroidery decorate the fronts, the centre one blousing slightly at the waist. The bishop sleeves are fashionably full, and are shirred top and bottom over fitted linings of taffeta. Straight cuffs of the batiste embroidery complete the wrists. Waists in this style are stylishly developed from any of the numerous weaves of fancy silk now in vogue, with ribbon, lace, insertion, jet or spangled passementerie for decoration. Rich combinations are possible by the mode.

The quantity of material 44 inches wide required to make this basque for a lady having a 36-inch bust measure is 3 1/2 yards.

EVENING BONNET OF SPANGLED NET.  
The home milliner has an excellent opportunity to show her originality in making up a variety of bonnets for evening wear. Spangled net is one of the newest and most popular materials to be employed in the make-up of these necessary little bits of feminine finery. Rhinestone buckles and bunches of half-blown pink roses complete this simple but effective little evening headdress.