

DOLLARS RECOVERED FROM WASTE PILES

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BY PAUL HATMAKER
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*The story of how efficient operating
methods save dollars and cents for the
purchasers of MOUNT AIRY
GRANITE*

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Dollars Recovered from Waste Piles

By Paul Hatmaker



*Part of a
10-acre
sheet of
granite*

North Carolina Granite Corp. Produces and Merchandises Crushed Stone Byproduct

PROBLEMS OF WASTE UTILIZATION have faced and confounded every one who has held a responsible position at any mine or quarry. No better criterion of progressive and efficient management exists than the ability to solve effectively this important and often irritating question of waste disposal. Many executives responsible for converting hard rock into dollars have neglected, to their eventual sorrow, this phase of their job; others not so immune to growing mountains of waste about their property have made half-hearted attempts to



dispose of such refuse, and a few enterprising persons have ably solved the problem. Their example is worth studying and emulation.

The North Carolina Granite Corp., at Mount Airy, N. C., under the leadership of J. D. Sargent, has well demonstrated how a virtually complete use may be made of all granite quarried. A brief

description of his methods may indicate to operators in allied industries possible ways and means of solving their own individual problems.

Mr. Sargent's task has not been easy nor has it been in all respects unique. Although the granite deposit at Mount Airy possesses certain natural features which favor economical operations, Mount



Panoramic view of property and plant of North Carolina Granite Corp. Mount Airy

Airy itself is relatively distant from many important markets and aggressive merchandising methods are required to compete successfully with quarries situated nearer the larger centers of consumption. Operating costs, therefore, have had to be pared to a minimum to offset higher costs of distribution. It was realized, years ago that "lower costs" was a phrase synonymous with waste utilization or waste elimination.

And so the problem was attacked with vigor. Two kinds of waste material were recognized: First, that which was lacking in desirable physical qualities—mainly weathered or sap rock near the surface; and second, a vastly greater quantity which resulted from the production of high grade dimension stone and was virtually byproduct material, sound structurally but unsalable as best stock. Much of it automatically became waste because of size, some accumulated because of off color, lack of proper texture, or some similar defect. But basically it had merit.

Efficient operation made it necessary to develop all possible uses for this by-product material, and such diversification of products has been a large factor in the

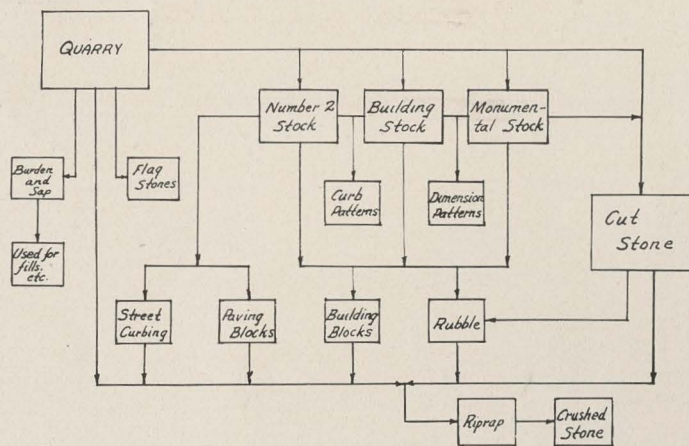


Chart 1. Flow of stone through the quarry

elimination of unsightly waste piles about the plant. Markets for paving blocks and street curbing have been intensively developed. Stone not required nor adaptable for building material is trimmed to $4\frac{1}{2} \times 5 \times 10$ in. (paving size). Odd sizes of blocks have been manufactured occasionally for special purposes. Flagstones are made from thin quarry blisters. They are irregular in shape, from 1 to 5 in. thick, and are comparatively smooth. They are used for walkways in gardens, for floors of open porches, and for similar places where the artistic charm of rough, natural stone is desired.

As much of the stone in the form of

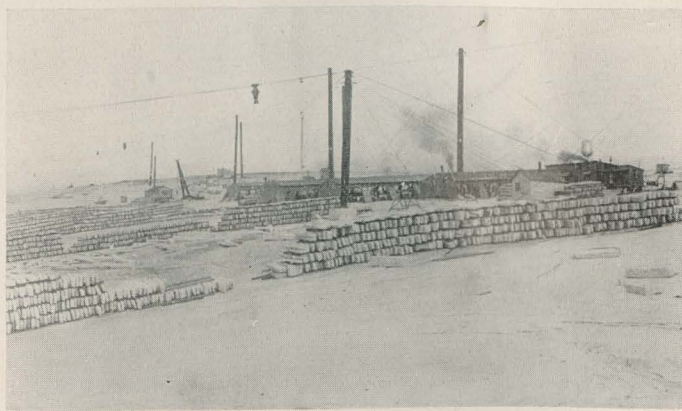
rough ashlar was suitable for residences, schools and churches, considerable emphasis has been placed upon this branch of the industry. Building blocks dressed and ready to set in the wall have been developed in two sizes called "Singles" and "Doubles." The "Singles" are from 6 to 7 in. in rise, 14 to 19 in. long, and $3\frac{1}{2}$ to 5 in. thick. The "Doubles" have the same range of sizes except that they are from 13 to 15 in. in rise. Such material differs from rubble in that it is ready to use, whereas rubble requires a certain

amount of shaping before the pieces can be fitted into a wall. These building blocks, once a side line, are now an important source of revenue.

But even with this diversification there still remained a large quantity of stone with which something had to be done. It consisted mainly of odd sizes, off-color material, and quarry refuse not suitable for any kind of dimension stock. Much of this has been found suitable for riprap for sea walls, embankments, and as aggregates in heavy concrete foundations. A good share of such material, however, could be marketed only as crushed stone. So a crushing plant was installed with



At east end of quarry. The sheet of granite in center foreground is the lower edge of a lift



Street curbing stacked up under the aerial cableways used in loading it on railway cars



te Corp. Mount Airy, N. C. Waste has been used for roads, fills and retaining walls

which to produce various grades of crushed granite.

The capacity of this plant is 400 to 500 tons in nine hours, depending to some extent upon the kinds of crushed stone desired. An important feature of the crushing and screening layout is its extreme flexibility. Material is brought to the plant in 30-ton dump cars, trucks and wagons. Primary crushing is done by a No. 7½ D Gates gyratory crusher which reduces the stone to 2¼-in. and smaller. From the crusher the material is elevated to revolving trommels fitted with the desired screen sizes (dependent upon current demand) the oversize being further reduced by a set of 24-in. Sturtevant rolls. A No. 5 Gates gyratory and an extra set of rolls provide insurance against possible breakdown. For storage there are six bins each of 100 tons capacity. Power is provided by two return-tubular 150-hp. boilers burning coal. The prime mover for the plant is a Hamilton-Corliss 175-hp. engine.

Marketing of crushed and sized stone has meant the development of specialty products. By crushing and screening the available waste rock, virtually any size can be produced from 2¼-in. down. Some of this is used as road material and

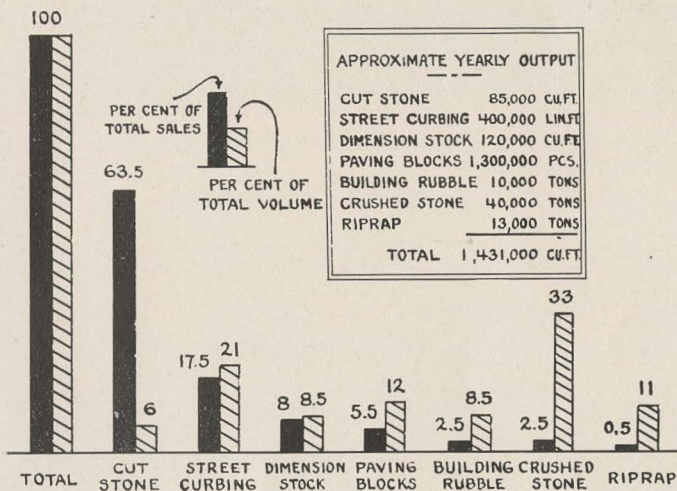


Chart 2. Percentages of sales value and of production volume

concrete aggregate. Sizes ¾ to ½ in. are sold for roofing gravel. Special aggregates are marketed for making concrete blocks, also for lamp posts which, when bushed down, present an attractive surface. Quantities of minus ¼-in. material are sold to railroads for station yards and track ballast. Other fine material is marketed as poultry grit, the potash content of the feldspar in the granite being considered highly beneficial to poultry.

Development of these outlets has not happened overnight. Many of the products have been used locally at first and then pushed to greater distances from

Mount Airy as demand was fostered. The highest grades of dimension stone now penetrate the markets in most states east from the Rocky mountains, whereas the other grades of dimension stock are more readily sold east from the Mississippi river and as far north as New York. Crushed stone from 1 to 2¼ in. is marketed mainly in North Carolina and Virginia. Material finer than 1-in., however, can be sold profitably in many of the eastern and middle western states.

Chart 1 indicates the general flow of stone from the quarry and shows how waste from many of the operations eventually becomes riprap or crushed stone. A significant feature of such a plan is the ease with which excess material is shunted to the particular products for which the current demand may be the greatest.

The percentages of the sales value and production volume of the several products are shown in Chart 2. It is apparent, of course, that the lower priced products are relatively greater in volume and less in value. Nevertheless, they do add very appreciably to the total sales value, besides disposing of stone which otherwise must accumulate in waste piles.



A portion of the paving block operation



Paving block cutters on the quarry floor



From in front of the office the visitor looks out through an artistic and well-kept park to the quarry beyond

Sale of these diverse products obviously has brought direct financial return. Perhaps more interesting, however, is the utilization of that waste, unsuitable for special products, from which the financial return has been more indirect but nevertheless almost as tangible.

It may be stated as being approximately correct that from a quarry more than 70 acres in extent and from which there has been removed upwards of 30,000,000 cu. ft. of stone, virtually none has really been wasted. In going over the property recently with William S. Martin, the treasurer of the company, it was amusing to hear him apologize for their having had to dump perhaps 50 tons of refuse as a waste pile. And it would be exceedingly unsafe to assert that this pile will not be used eventually for some purpose. Moreover, although an appreciable part of the waste has been utilized by the company instead of being sold, it can not be said that such material has not brought financial returns.

Much otherwise unusable stone has been used for road work in and about the property. Some has gone into the grading of railroad spurs. Unsightly depressions have been levelled. Attractive retaining walls have been built. A small stream close to the plant has been filled over, providing additional yard space while drainage continues underneath it.



The crushing plant, where much waste from this operation is converted into useful products



From these bins, waste granite, converted into various grades of crushed stone, is loaded for shipment

The company believes in advertising. Not only is the office built of their stone as are many homes in Mount Airy, but visits to the quarry by persons interested in any way in their products have been deftly encouraged. So one of the important results of the general policy of keeping the quarry spick and span is the favorable reaction upon visitors, no small matter in sales psychology.

An equally important result, moreover, is upon the employees. Naturally where every pound of stone is used or made to serve some purpose, a striking cleanliness results. The quarry itself looks as though it were perpetually swept with a broom. The finishing plant is as neat as an old Dutch kitchen. No tools are left around to get lost or for workmen to stumble over. Everything has a place and everything is in that place except while being used. No job is considered finished until

every trace of the disorder has been disposed of. Tidying up afterwards has become second nature with the men.

The results are manifold. There is an air of pride about the property. Morale is high and interest in the work is keen. Labor turnover is insignificant. The effect, too, of such a policy is far-reaching. Many a workman inspired by an insistence upon immaculate working places has gone home pos-

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Quarry blisters need not be wasted, for they make artistic flag stones for sidewalks, porches and courts

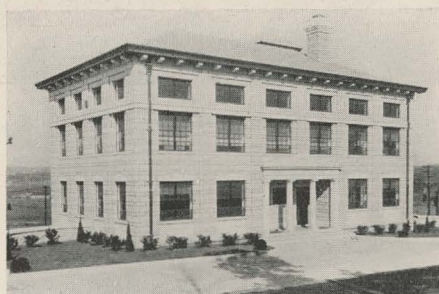


This rubble will soon be built into attractive walls of churches, schools, residences or other buildings

sessed by a pride that has led him to insist on higher standards in his own life.

Many a younger executive newly vested with responsibility and anxious to make good probably can do no other thing more worth his while than to insist on equivalent measures of neatness and efficiency about his own plant. It was the old fashioned policy to clean up sporadically, perhaps when some official from the home office was about to make an inspection. But no longer is slovenliness tolerated by modern business men; it has been too often proved that such neglect hastens bankruptcy or liquidation.

Probably few executives have ever received a more fitting tribute to their effi-



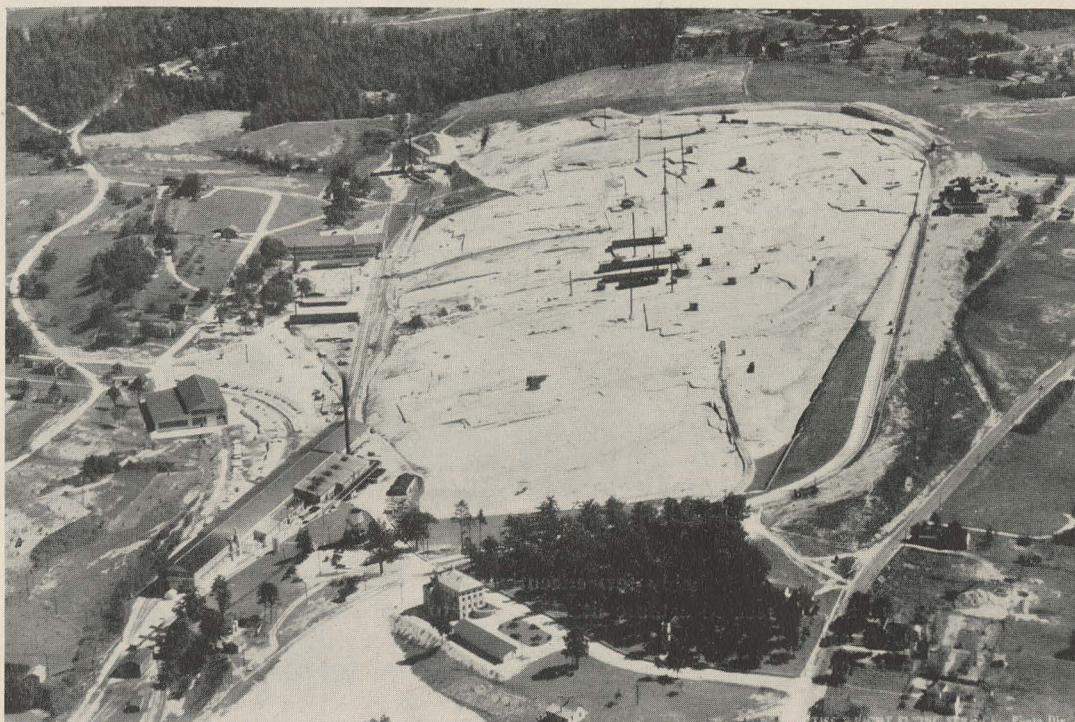
The office building

ciency and progressiveness than that paid to Mr. Sargent recently when a friend presented him with a costly and artistic rug for the floor of the plant engine room.

To J. D. Sargent, president; W. F. Shaffner, vice-president; C. Binder, general manager; W. S. Martin, secretary and treasurer, and J. P. Frank, assistant secretary-treasurer, officers of the North Carolina Granite Corp., are due thanks for their courtesy and aid in the preparation of this brief sketch of a significant phase of their operation.



The foot of the mast is the old quarry floor. The stone blocks are segments of granite sheets loosened by "blasting" with compressed air



An aerial view of the Mount Airy Quarry and Plant

WHITE MOUNT AIRY GRANITE

The Best for Better Buildings and Memorials

Rich texture and sparkling white beauty have won for Mount Airy Granite a position of undisputed leadership among American granites.

An almost ideal quarry combined with modern machinery and equipment assures the economical production of granite products of all kinds.

It pays to think of Mount Airy when in the market for granite.

THE NORTH CAROLINA GRANITE CORPORATION

Mount Airy, North Carolina

Branch Offices at

127 N. Dearborn Street
Chicago

1001 Witherspoon Building
Philadelphia

207 Fulton Building
Pittsburgh