

A HISTORY OF THE NAVAL STORES INDUSTRY
IN THE UNITED STATES

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INTRODUCTION

The early application of the products of pine forests, such as pitch, tar, rosin, turpentine and clap-boards, to the construction of ships and in the maintenance of the navy gave rise to the generic term of "Naval Stores" as the designation of that industry. These products are no longer utilized in connection with shipping to a very large extent but the name still designates the industry.

GENERAL DEVELOPMENT OF THE INDUSTRY

The gathering of crude turpentine from the long-leaf pine (*Pinus palustris*) was among the first industries to attract the attention of the early settlers of the territory now forming the State of North Carolina. The earliest reference referring to the industry in this country is found in Sir Humphrey Gilbert's report in 1584.

"Not only could turpentine, rosin, pitch, tar, xxx, be manufactured in those lands xxx."¹

At first the oleoresin was gathered and shipped as a raw material, but this primitive method was followed by the manufacture of tar and pitch and later by the distillation of spirits of turpentine.²

The early development of the industry was largely influenced by the demands of the Mother Country, England, for great quantities of cheap naval stores for her navy. The Mother Country not only recommended but commanded the colonists to pro-

1. Econ. Hist. of Virginia in 17th Cent. V. 1, p. 46.
2. 12th Census of the U.S., Manuf. Pt. III, p. 1003.

duce naval stores with the result that many attempts to produce them were made in the northern colonies of New York and Massachusetts as well as in the southern colonies of the Carolinas and Virginia. However, the actual production in the northern colonies never became an important phase of the industry; their chief connection with it was later in the distillation of the crude turpentine.

The industry has been extended to other sections of our country and is important in all regions where the long-leaf pine (*Pinus palustris*) is found in sufficient abundance to warrant production and it has been an important factor in the development of the South Atlantic and Eastern Gulf States. Experiments are being conducted at the present time to determine the value of the yellow or western pine (*Pinus ponderosa*) as a producer of naval stores.³

In the early history of the growth of the industry the crude oleoresin was shipped to European and later to Northern ports for distillation from the ports of Wilmington and Newbern which received it from the region between the Tar and Cape Fear Rivers in North Carolina. Later distilleries were operated in Wilmington, Newbern and other ports which received the crude material from inland. The process was effected in early times in crude iron retorts. The introduction of the copper still in 1834 revolutionized the distillation part of the industry since it enabled the distillation to be carried on farther inland and led to a largely increased yield of volatile oil.⁴ The method of dis-

3. U. S. Dept. Agr. Bull. No. 229, p. 47 - 1915.

4. Report of the Div. of For., Dept. Agr. 1892, Bull. 31, p. 81.

tillation had not changed materially, after the introduction of the copper still, until recent years when the department of forestry devised a method using the thermometer, whereby a better quality and larger quantity of spirit was obtained.⁵ The quantity of spirits obtained depends largely upon the character of the crude turpentine and the skill of the distiller. The crude turpentine is composed of "dip" which is the "gum" in a liquid state, and of "scrape" which is the solidified oleoresin scraped from the tree. The best quality and largest quantity of spirit is obtained during the first year the tree is worked, when the oleoresin is known as "virgin dip" or "soft white gum". This type of oleoresin is almost colorless and contains the largest quantity of volatile oil. In the following year the gum is of a deeper yellowish color and is known as "yellow dip". With each succeeding year the oleoresin becomes darker in color, more viscid and poorer in volatile oil.⁶

Statistics for the industry were first presented in reports of the census of 1840, but the manufacture of naval stores had become of considerable importance prior to that date. With the exception of temporary depressions the industry has steadily increased, until in 1800, the value of the products amounted to \$20,344,888.⁷ During the decade ending with 1900 the export of spirits of turpentine to foreign countries amounted to 15,504,434 gallons annually. The greatest amount, 18,351,140 gallons being exported in 1898.⁸ In 1850 the industry was largely confined to

5. U. S. Dept. Agr. Bull. No. 229, p. 28.

6. U. S. Dept. Agr. Div. For., Bull. No. 13, p. 67 - Mohr, C.

7. Report upon Forestry, 1877, p. 139 - Hough, F. B.

8. 13th Census of U. S. Manuf. p. 679

North Carolina, the product of which was valued at \$2,476,252, or 86.7% of the total value of the product for that year. The industry appears to have reached its highest point in that state about 1880 and to have gradually decreased since then, with its continuous development in the states to the south. The industry gradually expanded until North Carolina became succeeded by South Carolina, Georgia, and Florida, respectively, as the greatest producer of naval stores.⁹

THE SOURCE OF NAVAL STORES

The extensive forests of long-leaf, yellow or Georgia pine (*Pinus palustris*) extending from North Carolina to Louisiana at a distance of 50 to 100 miles from the coast have made possible the great development of the naval stores industry in this country.¹⁰ Other sources are given as Loblolly pine or *pinus Taeda*,¹¹ (*Pinus Rigida*) or northern pitch pine, *pinus Resinosa* or Norway pine,¹² *pinus Australis* or long-leaved pine¹³ and *pinus heterophylla* or slash pine.¹⁴

The wholesale exploitation of the bountiful forests of long-leaf pine previous to the late nineties seriously depleted our long-leaf pine forests. This was due in a large measure to the prejudice against lumber cut from turpentine trees and the lack of transportation facilities in many regions where turpentine operations were conducted. Consequently, large

9. The South in the Building of a Nation V. 5, p. 259 - Ballagh,
10. Report upon Forestry, 1877, p. 137 - Hough, F. B. J.C.
11. Dispensatory of the U.S. of Am., Ed. II, p. 659 - Wood and Bache
12. Report upon Forestry 1878, V. 2, p. 331 - Hough, F. B.
13. Woods and Timbers of North Carolina, p. 44 - Hale, M. P.
14. U. S. Dept. Agr. Bull. No. 229, p. 10, Schorger, A. and
Betts, H.

tracts of timber, after being turpented, were abandoned and left to be destroyed by fire, wind and decay. It is estimated that in each of the states, North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi, the loss in boxed timber has amounted to from three to ten billion board feet.¹⁵

In recent years the damage to standing timber due to turpentine operations has been reduced considerably. The introduction of the cup system has lessened the fire risk, and the heavy demand for lumber coupled with improved transportation facilities has shortened the period between the end of turpentine operations and the beginning of lumbering. But, the overcoming of one evil has led to the growth of another, that is, the practice of turpentine undersized trees since the supply of available mature timber has decreased. When a young tree is boxed, it makes little further growth and, as a rule, produces hardly enough product to pay for the operation. Furthermore, it becomes a menace to the remainder of the forest through windfall, fire or decay. The scarcity of long-leaf pine has become acute in North and South Carolina and Georgia and is the natural result of exhausting the virgin pine forests.

Considerable virgin timber remains in Alabama, Louisiana, and Texas, but it is for the most part, held by large lumber syndicates which will not allow turpentine operations. The wanton exploitation of long-leaf pine has long passed its climax, and scientific utilization of what was previously waste is being carried out.¹⁶

15. U. S. Dept. Agr. Bull. No. 229, p. 41 - Schorger, A. and
16. Ibid, p. 41. Betts, H.

DEVELOPMENT OF THE INDUSTRY IN:

North Carolina.

North Carolina became the center of the industry at an early date and held the leadership until about 1880 when it was supplanted by South Carolina. Prior to the Revolution the collection of naval stores was largely confined to the district between the Tar and Cape Fear Rivers in North Carolina. The reason the production was confined so largely to this small area was because the trees were abundant and of an excellent variety for turpentine, and because the region was within easy reach of ports. Mr. John Lawson in his "History of North Carolina in 1670 observes "xxx none of our continental plantations are to be compared to Carolina for its vast quantities of naval stores such as pitch, tar, turpentine, rosin, masts, xxx."¹⁷

The industry gradually became established in the colony and in 1702 great quantities of pitch, tar and turpentine were exported.¹⁸ Unlike the colonists of Virginia, the early settlers in North Carolina could not preserve a balance of trade with England by paying for their necessities with tobacco, consequently, they had to depend on the production of naval stores for their support.¹⁹

The centralization of the industry in North Carolina has manifested itself in various names associated with the state as: The Tar Heel State, and The Turpentine State (see glossary).

England's great need of enormous supplies of naval

17. Annals of Commerce, V. 3, p. 558 - Lawson, J.

18. Origin of Commerce, V. 3, p. 15 - Anderson.

19. Ibid, p. 16.

stores, not only for her navy but also for her mercantile shipping, placed her in the power of the "Northern Crowns", Sweden and Denmark, who controlled the European supply of these commodities, since she had none of her own.²⁰ The "Northern Crowns" often charged exorbitant prices for these supplies and forced their shipping to be done in Swedish ships much to England's distress. This gave rise to a statute during the reign of Queen Anne, about 1700, referring especially to North Carolina, "xxx for encouraging the importation of naval stores from her Majesty's plantations in America xxx". In 1710 Mr. Byfield presented a proposal to the English Government whereby North Carolina should furnish the navy with pitch and tar, claiming "xxx these commodities could now be had in the colonies cheaper than in Sweden."²¹ Inadequate means of getting the produce aboard ship in the colony caused the King in 1716 to order a port at Bath County of Bath, North Carolina. "This being the best place for ships to take in masts, pitch, tar, turpentine, and other naval stores for use of his Majesty's fleet."²²

In 1720 about 6000 barrels of pitch and tar were exported from the colony to England,²³ and the industry had become very profitable to the colonists north of Albemarle Sound, from which region the commodities were taken to Norfolk or Nansemond, Virginia for market. No turpentine was distilled there at that time, but the crude turpentine was taken to England for distillation.²⁴

20. Origin of Commerce, V. 3, p. 16 - 1703.

21. Col. Records of N. Carolina 1672-'12, p. 721.

22. Col. Records of N. Carolina V. II, p. 237

23. Ibid, p. 396

24. North Carolina Geological Survey Bull. No. 5, p. 18.

Although the quantity of naval stores produced had progressed fairly rapidly up to this time, little attention had been paid to the quality of the products. Particular complaint was made:

1. That the planters made "hot tar", i. e. tar containing pyroligneous acids which burned the ropes.
2. That the planters often ran tar from the kilns into open basins, cut in the ground, and rain, dirt and sand became mixed with it before it was placed in the casks.
3. That the barrels which the planters used were made from green timber and so light that there was 15 - 20% leakage.²⁵

This caused strict requirement pertaining to the quality of the products to be set down, namely:

1. That inspectors be provided at the kilns to certify the quality of the product.
2. That the tar be run into prepared cisterns protected from rain.
3. That regulation casks of 34 gallons made from 3/4 inch pine staves be used.²⁶

The Revolutionary War placed a damper upon the progress of the industry in the colony for the following ten years. However, at that time it was producing far more naval stores than any other colony. After the war the industry continued to expand slowly but not until the introduction of the copper still in 1834 did it attain its full stride, for then the planters were enabled to distill the turpentine at the base of operations

25. The Colonial Records of North Carolina, V. 4, p. 442.

26. Ibid, V. 5, p. 266.

and could penetrate farther and farther from the ports.²⁷ The growth of the industry continued to flourish until 1880 and since then has gradually decreased. Today North Carolina is relatively unimportant as a producer of naval stores.²⁸

The following statistics of production will give a fairly comprehensive idea of the progress of the industry in the state:

Year	Exports
1720	6000 barrels of pitch and tar ²⁹
1764	36,747 " " naval stores ³⁰
1860	736,948 gal. sp. of turpentine; 77,851 bbls. turpentine and rosin
1870	2,042,756 " " " " ; 736,948 " " "
1880	3,830,009 " " " " ; 497,456 " " "
1890	1,751,270 " " " " ; 304,100 " " "
1900	53,974 " " " " ; 139,767 " " "

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Virginia

The earliest reference to the naval stores industry is undoubtedly found in the report of Sir Humphrey Gilbert in 1584 of his voyage to America. He reported about the coast which later became the coast of Virginia, "Not only could turpentine, rosin, pitch, tar, xxx be manufactured in these lands on a large scale xxx."³² In 1605 Harris in his voyage to the coast de-

27. Report Div. of For. Agr. Dept. 1892, p. 84.
 28. 12th Census of U. S. Manuf. Pt. III, p. 1003.
 29. Col. Records of North Carolina V. 2, p. 396
 30. Ibid V. 5, p. 266.
 31. U. S. Dept. Agr. Bull. 229, p. 7.
 32. Econ. Hist. of Virginia, p. 393 - Bruce, P. A.

clared, "The Firr-trees were the most numerous about these islands, and the turpentine they yielded was the best and sweetest our sailors pretend ever to have seen."³³

The actual working of the industry seems to have started soon after the founding of Jamestown in 1607. In 1608 eight Poles and Dutchmen were sent to Virginia by the London Company to teach the colonists to make naval stores, and in the same year, Captain Newport returned to England with a cargo made up largely of pitch and tar.³⁴ As far as known this was the first shipment of naval stores from this country.

The volume of production by the colony did not come up to the expectations of England, however, so in 1610 there was drafted "Instructions for suche things as are to be sente from Virginia. Harde pitche, tarre, turpentine, xxx" are mentioned." Included in the instructions were directions for producing the same. "Pyne trees or ffire trees are to be wounded within a yarde of the grounde, or boare a hoal with an agar the thirde pte into the tree and lett yt runne into anye thinge that maye receyve the same, and that wich yssues oute wilbe turpentyne worth 18^s tonne. When the tree beginneth to runne softelye yt is to be stopped up agayne for preserveinge the tree xxx. Pitche and tarre hath bene made there and we doubt not but wilbe agayne, and some sente for a sample, your owne tournes being firste served."³⁵ There seems to be no indication that these instructions were taken very seriously by the colonists, for in 1614 we find "The managers of the London Company find that these

33. Harris' Voyages, Sec. 1, V. 1, p. 817 - Rosier, G.

34. Econ. Hist. of Virginia, V. 1, p. 46 - Bruce, P. A.

35. Mates on the Exports of Virginia 1610 - Calendar of State Papers, V. 1, Colonial Series, p. 183.

articles can be produced more cheaply in Europe than in America."³⁶ Tar making did become a minor industry however and in 1619 the necessity of putting young men with the Polish colonists to learn how to make pitch and tar was pointed out.³⁷ In the same year note is made of the ship Bear sailing with a cargo of one hundred tons of tar.³⁸ But, the pine trees were too scattered, to make pitch and tar staple commodities of the colony. The little that was produced was often of inferior quality, in consequence of which, the King of England proclaimed in 1627. "His Majesty is much troubled how little account can be given of any substantial commodity from the colony, and how truly it may be said 'that this plantation is wholly built upon smoke, tobacco being the only means it has produced.' They are, therefore, not only recommended but commanded to take especial care in the making of pitch, tar, xxx."³⁹ But as late as 1662 the industry had made little headway in the colony and, in order to stimulate it, the planting of tobacco was prohibited.⁴⁰

The industry never reached very great proportions and became of little importance when the Carolinas commenced to supply the demand from England. In 1698 the only place in the colony where pitch and tar were made was in Elizabeth City and the amount made did not exceed 1200 barrels annually.⁴¹

36. Hist. of the U. S., V. 1, p. 223 - Ridpath, J. C.

37. Abstracts of Proc. of Va. Co. of Va. 1619-1624, p. 13.

38. Calendar of State Papers, Col. Series 1617-1621, p. 323.

39. Calendar of State Papers, Col. Series 1574-1660, p. 86.

40. Econ. Hist. of Virginia 1661-1668, p. 301.

41. Ibid, 1698 - V. III, p. 493 - Bruce, P. A.

Naval Stores Exported from Virginia ⁴²

Year	Spirits of turpentine - gallons	Turpentine and rosin in barrels
1860	3000	2748
1870	80	4347
1880	30	3585
1890	----	2491
1900	----	----

South Carolina

Previous to 1837 it was thought that the forests south and west of the Cape Fear River would not yield turpentine. A test was made in 1837, the error was discovered, and the industry expanded rapidly into South Carolina.⁴³

Small amounts of naval stores had been produced there long before that time. In 1704 pitch and tar were listed among the commodities making up part of the cargo of ships sailing from Charlestown.⁴⁴ In 1716, the South Carolina Assembly appealed to the King through the Lord Proprietors, "hoping that since South Carolina, being capable of producing great quantities of pitch, tar and turpentine, xxx that they would appeal to the King to protect them from the Indians."⁴⁵ However, it was not until after 1840, when many of the old operators left the old region in North Carolina to operate south of the Cape Fear River, that the business acquired noteworthy proportions there.⁴⁶

42. U. S. Dept. Agr. Bull. No. 229, p. 7

43. Report upon Forestry 1877 - p. 139 - Hough, F. B.

44. Collections of the Hist. Society of South Carolina, V.2,p.212.

45. Hist. of South Carolina under Proprietary Gov't.1670-1719.p.622.

46. Collections of the Hist. Society of South Carolina, V.2,p.165.

Henceforth the industry expanded rapidly, until in 1880 South Carolina led all states in production; 192 establishments reported a product valued at \$1,893,206, the largest production ever reported for that state.^{46a} However, she could not maintain this lead very long since her supply of long-leaf pine forests was much less than that of her rival states to the south. What forests there were, were rapidly exploited, and South Carolina became of little importance as a producer of naval stores.

Year	Spirits of turpentine (gal.)	Turpentine, rosin and pitch (bbl.)
1860	315,099	50,753
1870	337,530	25,279
1880	1,691,447	158,563
1890	1,293,389	140,399
1900	-----	21,248

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Georgia

Some naval stores were produced by colonists in Georgia at a comparatively early date. In 1763, 264 barrels of tar were reported to have been shipped.⁴⁸

The recent development of the industry entered the forests of Georgia with the decade ending in 1850, as it expanded southward from South Carolina. The apparently unlimited resources of the long-leaf pine in the state have furnished a rich field for the operation of the industry. Consequently, it has been conducted on a greedy commercial basis, wantonly destroying the fine

46a. 12th U. S. Census, Manuf. Pt. III, p. 1003

47. U. S. Dept. Agr. Bull. 229, p. 7.

48. Annals of Commerce V. 3, p. 363.

timber, irrespective of future needs. Under these conditions its development has been rapid, Georgia leading all other states in production from 1890-1900, but the possibilities of its continued prosperity have been greatly diminished.⁴⁹

Statistics of Production for Georgia

Year	Spirits of turpentine (gal.)	Turpentine, rosin, and pitch (bbl.)
1860	137	134
1870	7,558	519
1880	570,549	91,909
1890	7,251,929	841,217
1900	14,623,328	1,408,928
1910		

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NORTHERN COLONIES

New York

Many early attempts were made to introduce the industry into New York and adjacent northern colonies. In 1698, the Lords of Trade, in a letter to the Earl of Bellomont, set forth the desirability of producing naval stores in the colony.⁵¹ The Earl of Bellomont made zealous efforts to promote the industry, declaring, "New York is the only fit place to produce naval stores," and later that he expects to "Supply naval stores for all England's use at one-half of the present cost."⁵² Again, in 1699, he reported having consulted with M. Bernon, a French merchant

49. 12th U. S. Census, Manuf. Pt. III, p. 1003

50. U. S. Dept. Agr. Bull. 229, p. 7.

51. Colonial History of New York, V. 4, p. 298.

52. Ibid, p. 529.

who had made considerable naval stores, who advised that one man could make five tons of naval stores in a year.⁵³

At that time, there were a large number of Polatinate families settled in the colony who knew how to make naval stores and many efforts were made to divert their attention to the industry. This plan did not succeed, so the Earl of Bellomont proposed to employ English soldiers under slightly increased pay in the production.⁵⁴ This plan was favorably considered for a time, but it never materialized.

In order to further encourage the colonists to produce naval stores, the English Parliament offered bounties for their production, but the source of suitable pine in New York and other northern colonies was insufficient to make the industry profitable, and before the Revolutionary War, North Carolina had become the source from which most of the naval stores were exported.⁵⁵

The statistics of the exportation of naval stores from New York are not indicative of the extent of the production there since most of its exports were shipped in from the south.

Massachusetts

The early settlers of Massachusetts endeavored to establish the naval stores industry there. They succeeded to a slight extent, and, in 1665, some pitch and tar was sent to Barbadoes in exchange for tobacco and sugar.⁵⁶ In a letter to the

53. Colonial History of New York, V. 4, p. 643.

54. Ibid, p. 699

55. Report upon Forrestry 1878-79; V. 2, p. 331.

56. Calendar of State Papers 1661-1668, p. 346.

home company in 1732 we find "Encourage men to come to the colony where the chances to make hemp, pitch, tar xxx are very good."⁵⁷

The payment of the minister's salary partly by naval stores was a common practice in the colony. "Sixty pounds would finish this minister's house, half payment in tar and corn, the tar to be twelve pence to the barrel cheaper than at Boston."⁵⁸

However the colony imported most of its naval stores as raw material and became chiefly concerned in the distillation of the crude oleoresin when the southern production came into prominence.

New Hampshire

New Hampshire like Massachusetts tried to produce naval stores from the northern pines but with no greater success. In 1763, the Lords of Trade ordered the magistrates of the colony to produce 10,000 barrels of tar, but there is no record that this order was obeyed.⁵⁹ Some naval stores were produced in New Hampshire as is shown by the following: Col. Allen in New Hampshire is turning out people without due process of law and so distracts people that we fear for the production of naval stores."⁶⁰ However the northern pines could not compare with the long-leafed pine of the south as a producer of naval stores and quickly lost its prestige in that field when the south became settled.

Other Southern States

Georgia is rapidly declining as a factor in the total production of naval stores, and Florida has taken the lead as a

57. Calendar of State Papers 1775-76, p. 73.

58. Collections of the Mass. Hist. Soc. V. 3, p. 186.

59. Calendar of State Papers, Col. Series, 1675-76, p. 74.

60. Col. Hist. of the State of New York, V. 4; p. 380

producer since 1905. While the forests of Florida are not being exploited as were those of Georgia, it is evident from its decreasing output that it will soon be supplanted by other states farther west in which the industry is younger.⁶¹

Alabama, too, has been worked to a large extent as has Mississippi. But, Mississippi holds forth better prospects for the next few years.⁶² Louisiana and Texas have large tracts of unworked timber, but these tracts are mostly in the hands of large lumber corporations which oppose turpentine operations. That the shortsighted exploitation of the virgin forests of the South Atlantic and Gulf States has caused the turpentine industry of the future to be a difficult problem, there can be no question. The only solution appears to be a systematic cultivation of the long-leaf pine and common sense methods of utilizing the trees.

METHODS OF PRODUCTION AND MANUFACTURE OF NAVAL STORES

Turpentine

The method of collecting the crude turpentine changed very little during the early history of the industry in this country. The method used was very crude and wasteful, but since slave labor and new timber lands were cheap, there was no incentive to devise more efficient methods.

The method of production as described by F. A. Michaux, who travelled through the south in 1783-4, is probably the most typical of the many early descriptions of the process. "xxx It, (turpentine) begins to distill about the middle of March, when

61. 12th U. S. Census, Manuf. Pt. III, p. 1003.

62. Senate Documents, 28 Cong., Series 1, V. 3, p. 111.

circulation commences, and flows with increased abundance as the weather becomes warmer, so that July and August are the most productive months. When the circulation is slackened by the chill of Autumn, the operation is discontinued and the remainder of the year occupied in preparatory labor for the following season, which consists first in making boxes. This is done in January and February. In the base of each tree, about three or four inches from the ground, and of preference on the south side, a cavity is formed, commonly of the capacity of three pints, but proportionate to the size of the trunk, of which it should occupy a quarter of the diameter. On stock more than six feet in circumference two, and sometimes four boxes are made on opposite sides. Next comes the raking, or clearing of the ground at the foot of the trees from leaves and herbage, by which means they are secured against fires that are often kindled in the woods by the carelessness of travelers and wagoners. If the flames gain the boxes already impregnated with turpentine they are rendered useless and others must be made. Notching is merely making at the sides of the boxes two oblique gutters about three inches long, to conduct into it the sap that exudes from the edges of the wound. In the interval of a fortnight, which is employed in this operation, the first boxes become filled with sap. A wooden shovel is used to transfer it to pails, which in turn are emptied into casks placed at convenient distances. To increase the product the upper edge of the box is chipped once a week, the bark and a portion of the wood being removed to the depth of four concentric circles. The boxes fill every three weeks. The turpentine thus produced is

the best and is called pure dippings xxx."⁶³

Other references describing similar methods of collection of turpentine are as follows: 64, 65, 66, 67, 68, 69.

The most important changes have been brought about within comparatively recent years through the efforts of the United States Division of Forestry. These efforts resulted in the displacement of the old boxing system in 1901, through the experiments of Dr. Charles H. Herty, of the forestry service, and first by the cup and gutter system, and later by what is known as the cup method. Complete descriptions of these methods can be found in reference 70.

Tar

"The primitive methods of gathering and shipping the crude turpentine as a raw material were followed by the manufacture of tar and pitch xxx."⁷¹

The making of tar from the wood of the pitch pine was attempted in practically all of the colonies, but thrived best in Carolina where the supply of pine was greatest. The methods of making it were quite similar throughout the entire region. A typical method was as follows: "They prepare a circular floor of clay, declining a little toward the center; from this is laid a

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63. Histoire des Arbres, Tom. 1, p. 73 - Francais Andre Michaux 1810.
64. The History of South Carolina, p. 96, 1685-Hematt.
65. A Voyage in North America in the Year 1768, p. 238-Taylor, G.
66. Proc. Am. Pharm. Assoc. 19, p. 491 - Handbury, D. 1871.
67. Schoepf, Reise, Etc., V. 2, p. 141, 1783-4. Schoepf --
68. A Tour in the U.S. of America, V. 2, p. 95 - Smith, J.F.D.
69. Sci. Am., 82-131, Mr. 3, 1900 - Hamkins, C. K.
70. U. S. Dept. Agr. Bull No. 229 - p. 22 - Schorger, A. and Betts, H.
71. 12th U. S. Census, Manuf. Pt. III, p. 1003.

pipe of wood, the upper end of which is even with the floor, and reaches ten feet without the circumference; under the end the earth is dug away, and barrels placed to receive the tar as it runs.

Upon this floor is built up a large pile, in the form of a pyramid, of pine split in pieces, and surrounded, or rather covered over with a wall, coat or body of earth, leaving only a small aperture at the top where the fire is first kindled.

When the fire begins to burn, they cover this opening likewise, to confine the fire from flaming out, and to leave only sufficient heat to force the tar downwards to the floor. They temper the heat, as they please by running a stick into the wall or thick coat of clay, and giving it air."⁷²

Similar methods of producing tar in early times are described in the following: 73, 74, 75, 76, 77.

Much of the tar produced in the Carolinas was shipped to the north in later years, where it was marketed. Evidence of this is found in the advertisements of the Boston Daily Advertiser⁷⁸ and the Philadelphia National Gazette and Literary Register.⁷⁹

Tar is now produced by destructive distillation in great retorts, where by careful regulation of the temperature a

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72. A Tour in the U. S. of America, V. 2, p. 95 - Smith, J. D.
73. The History of South Carolina, p. 96, 1685 - Hematt
74. A Voyage in N. America, p. 238, 1768 - Taylor, G.
75. Schoepf, Reise, Etc., V. 2, p. 141, 1783-4 - Schoepf, J.
76. Histoire des Arbes, Tom. 1, p. 73, 1810 - Michaux, F. A.
77. Sci. Am. 82-131, Mr. 3, 1900 - Hamkins, C. K.
78. Boston Dailay Advertiser 6, No. 7, June 8, 1814, p. 1, c.1.
79. Philadelphia National Gazette and Lit. Register 6, No. 1.
1718; May 23, 1826; p. 4, c.4.

quality of the product is produced which is very superior to the tar made in the old kilns.

Pitch

The production of pitch occurred wherever tar was produced since it could easily be made from it. The method of making it was: "From the tar is burned pitch, either in great iron cauldrons or, more commonly, in pits, six feet deep and four and a half across, and lined with clay if the soil is not already clay. Such a pit can hold fifty or more casks of tar. Three casks of tar give about two of pitch."⁸⁰

The pitch was shipped to the northern colonies and to England in approximately the same proportions as tar.

Oil of Turpentine

When the naval stores industry was in its infancy in the colonies, the crude turpentine was shipped to England or New England for distillation. In 1820 the Boston Daily Advertiser carried an advertisement "Rice and Henshaw, No. 27 India Street have constantly for sale on the most reasonable terms, xxx, received from the turpentine distillery, spirits of turpentine, xxx."⁸¹ The first report made of its distillation in the Carolinas was in 1784.⁸² From that time until the invention of the copper still in 1834, the distillation was carried out in crude iron stills which were very inefficient.⁸³ The introduction of

80. Schoepf, Reise, Etc. V. 2, p. 140, - Schoepf, J.

81. The Boston Daily Advertiser 30; No. 79; Oct. 13, 1820, p.1, c.5.

82. Schoepf, Reise, Etc. V. 2, p. 140, 247 - Schoepf, J.

83. Am. Journ. of Pharm. 29, p. 62 - Battey, R.

the copper still in 1834 made vital changes in the entire industry since it enabled the distillation to be carried on at the place where the crude turpentine was collected. Consequently stills were set up far inland whereas they had previously been located only near the ports.⁸⁴

The distillation of the crude turpentine often gave cause for complaints in the cities through the danger of fire which the process incurred. A typical example of this is found in Philadelphia where the distillation of turpentine in thickly settled parts of the city, unless in fireproof buildings, was prohibited by law.⁸⁵

The introduction of the practice of using water during the distillation and regulating the temperature have been later developments of the process - they are described fully in 86.

Rosin

Rosin is the residue left after the oil of turpentine has been distilled from the crude gum. A cask of crude turpentine usually produces about three gallons of turpentine oil and twenty-nine gallons of rosin.⁸⁷ The rosin while hot is run through strainers to remove impurities. This process is fully described in 88.

Numerous methods of grading rosin have been used and it is not certain when the various terms designating the various grades first came into use.

84. 12th U. S. Census, Manuf. Pt. III, p. 1003.

85. Picture of Philadelphia, p. 136, 1816 - Mease, J.

86. U. S. Dept. Agr. Bull. No. 229, Schorger, A. and Betts, H.

87. Schoepf, Reise, Etc. V. 2, p. 141 - Schoepf, J.

88. U. S. Dept. Agr. Bull. No. 229, p. 30, Schorger, E. and Betts, H.

The earliest grades were black and yellow rosin.⁸⁹

In 1826, it is found listed as bright rosin, first quality; bright rosin, second quality; bright rosin middle and common quality.⁹⁰

In 1856, it is listed as Rosin No. 1; No. 2; No. 3; etc.⁹¹

In 1887, a grading is found wherein it is designated as:

C - pale yellow and transparent ("virgin rosin")

C Album - or brownish yellow and translucent

C Commune - according to the care taken in its preparation.⁹²

Since 1890 the following grades have been recognized in the American market:

WW - (water white)	} the lightest and highest grades obtained from virgin dip.
WG - (window glass)	
N - (extra pale)	
M - (pale)	
K - (low pale)	
I - (good No. 1)	
H - (No. 1)	
F - (good No. 2)	
E - (No. 2)	
D - (good strain)	
C - (strain)	
B - (common strain)	
A - (black)	⁹³

89. Col. Hist. of New York, V. 4, p. 501 - 1699.

90. Phila. National Gaz. and Lit. Reg. 6, No. 1619, Jan. 26, 1826, p. 2, c. 2.

91. Wilmington N. C. Daily Jour. 6 No. 5, 9/11/1856, p. 2, c. 5.

92. Johnson's Universal Encyclopedia 6, p. 759 - Chandler, C. F.

93. U. S. Dept. Agr. Bull. No. 13, p. 67.

GLOSSARY OF TERMS USED IN CONNECTION WITH
THE NAVAL STORES INDUSTRY

Barking

"Before the turpentine season opens, the outer bark is removed over an area exceeding somewhat the area to be chipped during the coming season."⁹⁴

Batting Dross

"The cotton batting, after being used to strain the rozin, is known as 'batting dross' or 'rozin dross'."⁹⁵

Box

"The first operation in turpentine by the box method consists in cutting a cavity into the base of the tree for holding the crude gum. This cavity, called the 'box' is cut during the winter months."⁹⁶

Boxing

"The turpentine was obtained by boxing the trees in winter. That is, by cutting a hole into the side about three inches deep and twelve inches long."⁹⁷

Chipping

"To increase the product, the upper edge of the box is chipped once a week, the bark and a portion of the wood being removed to a depth of four concentric circles."⁹⁸

"Trees are chipped or scarified when warm weather comes. It is done by removing the bark and wood to a depth of about one inch above the box. Chipping is repeated every week of the season. The tool used is called a 'hack'."⁹⁹

94. U. S. Dept. Agr. Bull. No. 229, p. 32.

95. Ibid, p. 31.

96. Ibid, p. 14.

97. Report upon Forestry 1877, p. 137 - Hough, F. B.

98. Histoire des Arbes, Tom. 1; p. 73 - Mischaux, F. A.

99. Sci. Am. 82-131; Mr. 3 - 1900 - Hamkins, C. K.

Coaling

"Tar is coaled from the wood of this and other sorts of pines, but old windfalls and dead limbs of the pitch pine are greatly preferred xxx."¹⁰⁰

Colophony

See Rozin - Reference 147.

Cornering

"Cornering" has come into use now instead of "notching".¹⁰¹

See Notching - Reference 135.

Crop

"Ten-thousand boxes constitute a working unit or 'crop' requiring 100-200 acres of land in the new region along the coast and 500-1600 in the worked out district of North Carolina."¹⁰²

In practice a 'crop' consists of the number of faces a man can chip in from four to five days."¹⁰³

Crude Turpentine

"Turpentine is the gum, in the liquid state of the species of pine called pitch pine, extracted by incision and the heat of the sun while the tree is growing."¹⁰⁴

"Turpentine is the sap in its natural state as it flows from the tree."¹⁰⁵

"Turpentine is the gum in the liquid state extracted by incision of the tree."¹⁰⁶

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100. Travels in the Confederacy, V. 2, p. 140 - Morrison, A. J.
101. U. S. Dept. Agr. Bull. No. 229, p. 2.
102. Sci. Am. 82-131; Mr. 3 - 1900 - Hamkins, C. K.
103. U. S. Dept. Agr. Bull. No. 229, p. 18.
104. The Hist. of S. Carolina p. 96, 1685 - Hematt.
105. Forestry of N. Carolina, p. 43.
106. Hist. Collections of S. Carolina, V. 2, p. 235 - Carroll, B.R.

"It consists of a volatile oil and a solid resin held in solution partially suspended in the former. The best quality is obtained during the first year the tree is worked, known as 'virgin dip' or 'soft white gum', which is almost colorless and contains the highest quantity of volatile oil. In the following year it is of a deeper yellowish color, the 'yellow dip', which with each succeeding year becomes darker in color, more viscid, and poorer in volatile oil. The resin, toward the end of the season produced on the tree under the influence of cooler temperature is called 'hard gum' or 'scrape'."¹⁰⁷

Dead Tar

Tar made from 'Lightwood' is called "dead tar".¹⁰⁸

Dip

"The crude turpentine is composed of 'dip' which is the gum in a liquid state."¹⁰⁹

Dipper

"The workman uses a tool called a 'dipper' which has a flat trowel-shaped blade about $7\frac{1}{2}$ inches long and $5\frac{1}{2}$ inches wide."¹¹⁰

Dipping

"The boxes fill with gum in three or four weeks and are 'dipped' or emptied about seven times a season."¹¹¹

Face

"The scar on the tree caused by successive chippings is usually about 14 inches wide, and is known as the face."¹¹²

107. U. S. Dept. Agr. Bull. No. 13, p. 67 - Mohr, C.

108. Commercial Review of the South and West, V. 8, p. 450

109. U. S. Census of 1900 Manuf. Pt. III, p. 1003.

110. U. S. Dept. Agr. Bull. No. 229, p. 17.

111. Ibid.

112. Ibid, p. 13.

Green Tar

Tar made from green trees is called "green tar".¹¹³

Gum

See Crude Turpentine - References 104 and 106.

Hack

"The instrument used for chipping or making the 'streak' is called a 'hack'."¹¹⁴

Hard Gum

See "Scrape" - Reference 153.

Also, see Crude Turpentine - Reference 107.

Hot Pitch

"Hot tar and pitch which burned the sailor's ropes."¹¹⁵
(containing pyroligneous acids.)

Hot Tar

See hot pitch.

Kindlings

See Lightwood - Reference 123.

Lightwood

"They take such trees as are killed almost with fatness and age, which in Florida, they call 'lightwood'."¹¹⁶

"This dead wood used for tar burning is called 'lightwood'."¹¹⁷

"They (Indians) generally burn pine, or lightwood, that is the fat knots of dead pine trees."¹¹⁸

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113. Commercial Review of the South and West, V. 8, p. 450.
114. U. S. Dept. Agr. Bull. No. 229, p. 16.
115. The Col. Records of N. Carolina V. III, p. 506.
116. The Compleat English Physician, p. 1033 - Salmon, W.
117. Schoepf, Reise, Etc. V. 2, p. 67 - Schoepf, J.
118. Virginia II, p. 136 - Beverly, R.

Lightwood

"Whenever the sap-wood of a tree is laid bare copious exudation of the resin takes place and the surrounding wood becomes charged with it. This resin charged wood is termed lightwood."¹¹⁹

"Pine wood as opposed to slower burning wood, not on account of its lightness, but of the light afforded by it in burning, a matter of some importance when candles are not to be had."¹²⁰

"Any wood used in lighting a fire; in southern states resinous pine wood."¹²¹

"The bright, blazing pitch pine, called 'lightwood' at the south."¹²²

"The hearts and knots, 'lightwood' of the decaying pine timber are utilized for fuel and also for light instead of lamps, by the backwoodsman."¹²³

"The most valuable material is wood rich in resinous contents, in which lightwood and stumps rank first."¹²⁴

"By far the most important raw material in the pine products industry is the lightwood, a name given to the non-decaying resinous parts of the dead pine trees."¹²⁵

Naval Stores

"That by the Naval Store Laws now in force, which comprehend only pitch, tar, and turpentine."¹²⁶

119. U. S. Dept. Agr. Div. For. Bull. 13, p. 47.

120. Dictionary of Americanisms 3rd Ed. p. 244.

121. The English of the New World, p. 500.

122. Century Magazine, 29, 880/2.

123. Murray's English Dictionary, V. 6, pt. 1, p. 281, c.2.

124. 10th U. S. Census, V. 5, pt. 2, p. 313.

125. Jour. Indust. and Applied Chem., V. 1, p. 598.

126. Origin of Commerce, V. 2, p. 283.

Naval Stores

"Stores pertaining to ships or the navy."¹²⁷

"Under this term it is customary to include the resinous products of forests as they appear in the market, after being manufactured or prepared as pitch, tar, resin, turpentine and spirits of turpentine."¹²⁸

"All those articles or materials made use of in shipping or in the navy."¹²⁹

"Under the name of naval stores are comprised the products derived from the resinous exudation of cone bearing trees, mostly pines, including tar xxx. The name is undoubtedly derived from their extensive consumption in the shipyards and on board vessels."¹³⁰

"Up to the middle of the last century the products of the industry were tar and pitch which were used principally in ship building and as naval supplies, and hence were termed naval stores."¹³¹

"The early application of these products (pitch, tar and turpentine) to shipbuilding gave rise to the generic term 'naval stores' as the designation of the industry, but as only a small portion of the products are now used for this purpose, the term has become a misnomer."¹³²

"Pitch and tar were the chief products of the industry up to the middle of the eighteenth century. Their extensive use

127. Webster's Am. Dictionary of the Eng. Language 1853, p. 743.

128. Report upon Forestry 1878-79, V. 2, p. 331.

129. Murray's Eng. Dictionary, V. 6, Pt. 2, p. 46.

130. U. S. Dept. Agr., Div. For. Bull. No. 13, p. 67.

131. The Volatile Oils, p. 240 - Gildemeister, E. and Hoffmann, F.

132. 12th U. S. Census - Manuf. Pt. III, p. 1003.

in the construction and maintainance of sailing vessels caused them to be called 'naval stores', a term now applied to the turpentine and rozin industry, which has supplanted the production of tar and pitch."¹³³

"a. Supplies for vessels, especially war vessels.

b. Tar, pitch, turpentine and other resinous products."¹³⁴

New Dippings

See Pure Dippings.

The last mention of "new dippings" found before the use of the term "virgin dip" is in 1828.^{134a}

Notching

See Cornering - Reference 101.

"Notching is simply making at the sides of the boxes two oblique gutters about three inches long, to conduct into it the sap that exudes from the edges of the wound."¹³⁵

Oil of Turpentine

See Spirit of Turpentine - References 156 and 159.

Peak

"The apex of the angle (of the streak) is called the 'peak' and lies directly above the center of the box."¹³⁶

Pitch

"As to pitch, it is nothing but the solid part of the tar separated from the liquid by boiling."¹³⁷

133. U. S. Dept. Agr. Bull. No. 229, p. 2.

134. Webster's New International Dict. 1920, p. 1441.

134a. Philadelphia National Gazette and Literary Register No. 23, Aug. 18, 1828, p. 4, c. 1.

135. Histoire des Arbes, Tom. 1, p. 73.

136. U. S. Dept. Agr. Bull. No. 229, p. 16.

137. The Hist. of S. Carolina, p. 96.

Pitch

"Pitch is made by boiling tar in circular clay holes, made in the ground, or boiling in large iron kettles fixed in furnaces for that purpose."¹³⁸

"Pitch is the solid part of the tar separated from the liquid by boiling."¹³⁹

"Pitch is tar reduced about one-half by evaporation."¹⁴⁰

"Common pitch - the best quality is obtained by boiling down tar until it has lost about one-third of its weight."¹⁴¹

Puller

"After the first two seasons the height of the face makes the use of a hack impracticable, and a 'puller' is used in its place."¹⁴²

Pure Dippings

"'Pure dippings' or 'new dippings' were terms used to designate the first year's production of oleoresin before 'virgin dip' came into use."¹⁴³

Raking

"Next comes the raking, or clearing of the ground at the foot of the trees from leaves and herbage xxx."¹⁴⁴

Resin

See Crude Turpentine - Reference 107.

Round Timber

"While considerable 'round timber', that is timber which has never been tapped, xxx."¹⁴⁵

138. A Voyage to N. America in 1768, p. 238.

139. Hist. Collections of S. Carolina, V. 2, p. 235.

140. Forestry of N. Carolina, p. 43.

141. U. S. Dept. Agr. Div. For. Bull. 13, p. 67.

142. U. S. Dept. Agr. Bull. No. 229, p. 17.

143. Ibid, p. 2.

144. Histoire des Arbes, Tom. 1, p. 73.

145. U. S. Dept. Agr. Bull. No. 229, p. 17.

Rozin

"Turpentine is obtained by distillation and rozin is the remainder of the turpentine."¹⁴⁶

"It is called in Latin Colophonia (from Colophon, the place whence it first came) and in English, colophony and rozin xxx. It is made in England, from turpentine distilled, for after the oil of turpentine is drawn off the colophony or rozin remains at the bottom."¹⁴⁷

"Rozin is the residium left by distillation."¹⁴⁸

"Oil of turpentine is obtained by the distillation of the turpentine and the residue is common rozin."¹⁴⁹

"Rozin is the residium, or remainder of such turpentine after the oil is distilled from it."¹⁵⁰

The solid constituent of the crude turpentine which forms the residue remaining after its distillation."¹⁵¹

Rozin Dross

See "Batting Dross".

Scar

See "Face".

Scrape

"When it (turpentine) hardens upon the trunk, and is gotten off by proper implements, it is called 'scrape' of very inferior value to the virgin article."¹⁵²

146. The Hist. of S. Carolina, p. 96.

147. The Compleat English Physician, p. 975.

148. The Forests of N. Carolina, p. 44.

149. Travels in the Confederacy, V. 2, p. 140.

150. Hist. Collections of S. Carolina, V. 2, p. 235.

151. U. S. Dept. Agr. Bull. No. 13, p. 67.

152. The Woods and Timbers of N. Carolina, p. 44.

Scrape

"The resin toward the end of the season produced on the tree under the influence of a cooler temperature is called 'hard gum' or 'scrape'."¹⁵³

"'Scrape' contains about half as much turpentine as the 'dip' and gives a darker rozin under similar conditions."¹⁵⁴

Scrape Box

"A wooden box, called a 'scrape box' is used to receive the detached scrape."¹⁵⁵

Soft White Gum

See Crude Turpentine - Reference 107.

Spirits of Turpentine

"Spirits of turpentine or 'oil of turpentine' is obtained by the distillation of the turpentine."¹⁵⁶

"Spirits of turpentine is obtained by distillation of turpentine, and the residue is common rozin."¹⁵⁷

"'Spirits of turpentine' is obtained by distillation from turpentine, including 'scrape'."¹⁵⁸

"'Spirits of turpentine' or 'oil of turpentine' is the volatile constituent of the resin."¹⁵⁹

Streak

"The removal of two strips constitutes the 'streak' which is in the shape of a V, having an angle of about 95 deg."¹⁶⁰

153. U. S. Dept. Agr. Bull. No. 13, p. 67.

154. U. S. Dept. Agr. Bull. 229, p. 18.

155. U. S. Dept. Agr. Bull. No. 229, p. 18.

156. Hist. Collections of S. Carolina, V. 2, p. 235.

157. Schoepf, Reise, Etc. V. p.

158. The Forests of N. Carolina, p. 43.

159. U. S. Dept. Agr. Div. For. Bull. 13, p. 67.

160. U. S. Dept. Agr. Bull. No. 229, p. 16.

Tar

"It is nothing but turpentine forced out by the fire, and becomes black because it is mixed with all the fumes or smoke in the burning xxx."¹⁶¹

"Tar is the gum in the liquid state, but forced out by a proper degree of heat after the tree is cut down, split in pieces and dried."¹⁶²

"Tar is made by burning the dead limbs and wood in kilns."¹⁶³

"Tar is not exactly a by-product of the turpentine orchard, but is produced by the destructive distillation of the wood itself."¹⁶⁴

Tarheel

"An inhabitant of North Carolina (tar is one of the chief products of the State)."¹⁶⁵

"A nickname for a native of North Carolina, in illusion to tar as a principle product of that State."¹⁶⁵

"A name given in derision by Mississippians to a brigade of North Carolinians, who, in one of the great battles of the Civil War, failed to hold their position on a certain hill. They were taunted with having forgotten to tar their heels that morning and hence the name."¹⁶⁶

"A little volume of North Carolina sketches written by a talented friend of mine, in the genuine tarheel dialect."¹⁶⁷

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161. The Compleat English Physician, p. 1033.
162. Hist. Collections of S. Carolina, V. 2, p. 235.
163. The Forestry of N. Carolina, p. 43.
164. U. S. Dept. Agr. Div. For. Bull. 13, p. 67.
165. A Dict. of Slang and Colloquial English, p. 466.
166. Murray's Eng. Dict., V. 9, p. 94; c.2.
167. American Humorist, 2, - June 1888.

Tarheel

"The mountain tarheel gradually drifted into a condition of dreary indifference xxx."¹⁶⁸

Turpentine State

"North Carolina, producing from her immense pine forests large quantities of valuable products, derives from one of them the name of 'The Turpentine State'."¹⁶⁹

"The State of North Carolina so called from the quantity of turpentine obtained from its pine forests."¹⁷⁰

Turpentine Timber

"The proportion of high grade material that can be cut from 'turpented timber' is somewhat less than in the case of similar 'round timber'."¹⁷¹

Virgin Dip

"The best quality (of turpentine) is obtained during the first year the tree is worked and is known as 'virgin dip' or 'soft white gum'."¹⁷²

Also, see Crude Turpentine - Reference 107.

Yellow Dip

"In the following year the gum is of a deeper, yellowish color, the 'yellow dip' and with each succeeding year becomes darker in color."¹⁷³ Also, see Crude Turpentine - Reference 107.

168. Jour. Am. Folk Lore, II, p. 95.

169. Americanisms; The English of the New World, p. 661.

170. Dict. of Americanisms, 3rd Ed. p. 491.

171. U. S. Dept. Agr. Bull. No. 229, p. 27.

172. 12th U. S. Census - Manuf. Pt. III, p. 1003.

173. Ibid

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- 1742
Pennsylvania Gazette, No. 710, July 22, 1742, p.3, c.2.
Advertises spirit of turpentine and rozin.
- Berkley, Geo. 1744
American Magazine, July 1744, p. 589.
Discussion of the value of tar water in medicine.
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Ibid. 2 p. 145.
Criticism of Dr. Berkley's article on tar water.
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- 1748
Boston Gazette, No. 1460, May 10, 1748, p.3, c.1.
Advertises sale of rozin and oil of turpentine.
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- 1763
Georgia Gazette, Savannah, No. 30, Oct. 27, 1763, p.3, c.2.
Advertises for 24 sleepers of lightwood to complete
Fort George.
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- 1767
Ibid, No. 195, June 17, 1767, p. 4, c. 1.
Advertises for sale of spirits of turpentine in bottles.
-
- 1769
Ibid, No. 303, July 19, 1769, p. 2, c. 1.
Note of export from Savannah of 6 barrels of tar, 10
barrels of turpentine, and 260 barrels of pitch.

1792

Georgetown, Md. Weekly Register No. 16, July 28, 1792, p.1,c.3.

Notice of the arrival of the sloop, Polly, from Newbern with a cargo of spirits of turpentine.

1804

Richmond, Virginia Argus, 12, No. 1138, Mch.13, 1804, p.3,c.1.

Advertises spirits of turpentine.

1815

Boston Daily Advertiser 9, No. 11, Aug. 12, 1815, p.3, c.2.

Advertises 150 barrels of bright rozin suitable for soap and candle making, and 95 barrels of hard turpentine, 100 barrels of soft turpentine and 350 barrels of tar.

Mease, J.

1815

Picture of Philadelphia p. 136.

"xxx not permitted to boil or distill oil of turpentine or to make varnish in thickly settled part of city, xxx unless in an open place at least 30 feet from buildings xxx or in fire proof building."

1820

Boston Daily Advertiser 30, No. 79, Oct. 13, 1820, p. 1, c. 5.

Advertises spirits of turpentine and rozin.

1822

Ibid 34, No. 1, Jan. 1, 1822, p. 1, c. 5.

Advertises Wilmington and North County tar for sale.

1825

Nat'l. Gazette and Literary Register 5, No. 1321, Feb.7, 1825, p.3, c.1.

"16 barrels of spirits of turpentine in excellent order, and glued inside, just received and for sale xxx."
600 barrels of turpentine, 800 barrels of bright rozin, also advertised.

1825

Ibid, No. 1326, Feb. 12, 1825, p.1, c.2.

Advertises spirits of turpentine in glued casks for sale.

1825

Ibid, No. 1387, Apr. 15, 1825, p.3, c.1.

Advertises 50 barrels of Philadelphia distilled spirits of turpentine in single and double barrels.

1825

Ibid, No. 1461, July 22, 1825, p.1, c.2.

Advertises soft turpentine for sale.

1825

Ibid, No. 1477, Aug. 10, 1825, p.3, c.1.

Advertises soft turpentine, rozin, pitch and spirits of turpentine for sale.

1825

Ibid, No. 1556, Nov. 10, 1825, p.2, c.6.

Advertises soft turpentine and rozin for sale.

1826

Philadelphia Nat'l. Gazette and Literary Register 6,
No. 1618, Jan. 25, 1826, p.2., c.6.

Advertises 52 barrels of spirits of turpentine for sale.

1826

Ibid, No. 1619, Jan. 26, 1826, p.2, c.6.

Advertises hard and soft turpentine, bright rozin, suitable for soap making, and first and second quality pitch.

1826

Ibid, No. 1650, Mch. 3, 1826, p.4, c.5.

Advertises 500 kegs of tar for sale.

1826

Ibid, No. 1686, Apr. 15, 1826, p.1, c.2.

Advertises 100 barrels of Wilmington tar, 1000 barrels of Montgomery County tar, 1500 barrels of soft turpentine, and 1000 barrels of hard turpentine.

1826

Ibid, No. 1718, May 23, 1826, p.4, c.4.

Advertises 100 barrels of No. 1 rozin.

1826

Ibid, No. 1729, June 5, 1826, p.2, c.6.

Advertises 177 barrels of bright rozin, 9 barrels of soft dippings turpentine, 43 barrels of tar, and 30 casks of spirits of turpentine.

1827

Ibid, 7. No. 1928, Feb. 20, 1827, p.3, c.1.

Advertises 1500 barrels of North Carolina spirits of turpentine for sale.

1827

Ibid, No. 2140, Oct. 29, 1827, p.2, c.5.

Advertises 1000 barrels of superior quality tar for rope making and 1000 barrels of No. 1 and No. 2 bright rozin.

1827

Ibid, No. 2141, Oct. 30, 1827, p.2, c.6.

Advertises North Carolina spirits of turpentine for sale.

Ibid, No. 2918, Nov. 12, 1829, p.1, c.3.

Advertises 12 barrels of spirits of turpentine for sale.

1828

Ibid, No. 2230, Feb. 12, 1828, p.1, c.2.

Advertises 63 barrels of spirits of turpentine for sale.

1828

Ibid 8, No. 2342, Aug. 18, 1828, p.4, c.1.

Advertises 458 barrels of New Dipping turpentine and 28 casks of spirits of turpentine for sale.

1828

Ibid No. 2350, Aug. 27, 1828, p.3, c.3.

Advertises spirits of turpentine for sale.

1828

Ibid, No. 2355, Sept. 2, 1828, p.2, c.6.

Advertises 750 barrels of Wilmington soft turpentine, 50 barrels of spirits of turpentine, and 900 barrels of first and second quality bright rozin for sale.

1828

Ibid, No. 2367, Sept. 16, 1828, p.2, c.6.

Advertises new dippings turpentine for sale.

1829

Ibid 9, No. 2582, May 27, 1829, p.2, c.6.

Advertises 1000 barrels of Wilmington tar and 25 barrels of spirits of turpentine for sale.

1829

Ibid, No. 2647, Aug. 12, 1829, p.4, c.2.

Advertises 300 barrels of new dippings turpentine and 10 barrels of spirits of turpentine for sale.

1829

Ibid, No. 2718, Nov. 13, 1829, p.1, c.3.

Advertises 12 barrels of spirits of turpentine for sale.

1844

Boston Daily Advertiser 6, No. 7, June 8, 1844, p.1, c.6.
Advertises 18,000 barrels of soft turpentine for sale.

1853.

Webster's Am. Dict. of the Eng. Language, p. 745.
Naval stores - "Supplies pertaining to ships."

1856

Wilmington Daily Jour. No. 5, 9-11-1856, p.2, c.5.
Quotes current wholesale prices of turpentine, tar,
pitch, and rozin.

1860

Webster's Am. Dict. of the English Language, p. 745.
Naval stores - "Supplies pertaining to ships."

1873

Webster's Am. Dict. of the English Language, p. 877.
Naval stores - "Supplies having to do with ships or
with the navy."

Chandler, C. F.

1887

Johnson's Universal Cyclopedia 6, p. 759.
Grades rozin as c, c album, and c commune.

1894

Proceedings Am. Pharm. Assoc., 42, p. 606.
Gives details of new inspection rules as set forth by
the Savannah Board of Trade.

Brown, N. C.

1919

Forest products of the U. S., p. 184.
Mentions grades and prices for 1914-1918.

1920

Webster's New International Dictionary p. 1441.

"Naval stores - (a) supplies for vessels, especially war vessels; (b) tar, pitch, turpentine, and other resinous products."

Gamble, T.

1921

Naval Stores

A collection of material dealing with the history, production, distribution and consumption of naval stores.

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Asst. Prof. of Pharmacognosy.