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Dear Friends and Colleagues,

I am pleased to present to you the second edition of the Hilltop Review Journal: A Journal of Western Michigan University Graduate Research and Creative Works. The papers received by the editing team were extraordinary. I was encouraged to see all of the wonderful and exciting research taking place at Western Michigan University.

I would like to thank all of those who were involved, from the submitters to the editing staff. This would not have been possible had it not been for them.

Continue with the wonderful work I hope to explore more of it in the future as I continue my studies here at Western.

Christopher Jones
Editor, The Hilltop Review
Burgundian/Habsburg Mint Policies and World Bullion Flows: A Monetary Interpretation of the Rise and Fall of Antwerp, 1400-1600

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During the first half of the sixteenth century, the city of Antwerp (located in present-day Belgium about thirty miles north of Brussels) was one of the most significant entrepôts of the nascent modern world economy. A transcontinental clearinghouse, Antwerp served as a center for the redistribution of commodities from the Baltic and Mediterranean regions of Europe as well as from Africa, Asia, and the New World, and, as such, was the nexus of a trade network that encompassed the entire globe. Yet Antwerp’s position at the heart of the world economy was ephemeral; its economic power lasted scarcely more than fifty years, and by the beginning of the seventeenth century global economic primacy had shifted northward to Amsterdam.

While a number of diverse elements influenced Antwerp’s history, macroeconomic factors played a substantial role. The rise and fall of Antwerp as a commercial center from 1400 to 1600 was punctuated by the monetary policies of its rulers as well as by prevailing trends in international bullion markets. This paper will trace the development and decline of Antwerp’s economic influence, specifically analyzing three phases in the city’s history shaped by monetary factors. First, it will examine how Antwerp was able to displace Bruges as the primary economic hub of northern Europe during the late fifteenth century by embracing changes in English and Burgundian monetary policies. Second, it will show how the abundant supply of silver and copper in Antwerp allowed it to become the distribution center for Portuguese spices and, subsequently, a major center of the world economy during the first half of the sixteenth century. Finally, it will examine how the introduction of New World silver into the European economy, coupled with Habsburg monetary and financial policy, brought about the city’s decline as a global metropolis in the middle of the sixteenth century.

The Development of a European Metropolis, 1300-1500

Compared to the flourishing medieval cloth towns in the neighboring county of Flanders (Ypres, Ghent, Bruges), Antwerp, lying just across the Scheldt River in the duchy of Brabant, was a late bloomer. Long after the Flemish cities had established themselves as dynamic manufacturing and trading centers, Antwerp remained, by and large, a quiet backwater, its tranquility punctuated only by two annual regional fairs, one at Pentecost and the other around the feast of St. Bavo (October 1st), during which wine, food products, and raw materials were the primary traded goods. These two Antwerp fairs, however, corresponded with similar fairs held in nearby Bergen-op-Zoom during Easter and St. Martin’s (November 11th).1 The complementary nature of these Brabant fairs soon attracted an increasing number

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1 J. A. van Houtte, “La genèse du grand marché international d’Anvers a la fin du Moyen Age,” Revue belge de philologie et d’histoire/Belgish tijdschrift voor philologie en geschiedenis 19 (1940): 103. It should be noted that
of merchants, and by the mid-fourteenth century the volume of Antwerp’s trade was significant enough to attract the attention of the Count of Flanders, Louis of Male. During a successional crisis in Brabant in 1356, Louis annexed the city, making Antwerp a part of the county of Flanders. Whether the motive behind this seizure was to prevent Antwerp from competing commercially with Bruges and Ghent or to profit from its growing economic power is uncertain. Nevertheless, for the next half-century Antwerp would remain politically dominated by Flanders, and economically subordinate to its most powerful city, Bruges.

The Belgian economic historian Herman van der Wee has argued that the Flemish annexation of Antwerp was, paradoxically, a great boon for the city, since it connected Antwerp to the dominant economy of medieval northern Europe and brought greater numbers of merchants to its fairs.\(^2\) It should also be noted that the annexation placed the citizens of Antwerp in an exceptional position to observe how the Flemish cloth towns operated. Indeed, it may be useful to apply the great Harvard economic historian Alexander Gerschenkron’s theory of the advantages of economic backwardness to the city’s development.\(^3\) Antwerp’s relative backwardness (compared to the Flemish towns) encouraged its citizens to examine the contributing factors of Flemish success, emulate them, and adapt them to Antwerp’s own circumstances. Doubtless, Antwerp’s citizens benefited enormously from the knowledge of financial techniques and the mercantile savvy they borrowed from the Flemish towns. Little wonder, then, that Antwerp, when it blossomed, did so in such a dynamic fashion: it had imported the fundamentals of economic success from Flanders.

When Antwerp formally returned to the duchy of Brabant in 1405, it was liberated from the many limitations that Bruges had imposed upon its trade. Its fairs grew steadily longer in duration until they were virtually open year-round. Still, Bruges continued to eclipse the city economically, and was able to exercise its political power to influence commerce in Antwerp until the mid-fifteenth century. Only in the last quarter of the century would Antwerp surpass Bruges as the economic powerhouse of the Low Countries.

The re-centering of economic hegemony in northwestern Europe from Bruges to Antwerp in the late fifteenth century, like subsequent shifts from Antwerp to Amsterdam and Amsterdam to London, has been the subject of a great deal of historical debate. Many historians have attempted to explain the transition from Bruges to Antwerp in terms of long-term exogenous trends. Herman van der Wee has noted, for example, that, throughout the fifteenth century, skippers from Holland and Zeeland, who preferred conducting business at Antwerp, slowly undermined the monopoly of the Baltic held for so long by the Hansa merchants, who preferred Bruges.\(^4\) Both van der Wee and John H. Munro have also pointed

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to the reemergence of overland trade during the fifteenth century, which favored Antwerp.\footnote{Ibid.; John H. Munro, “The Low Countries’ Export Trade in Textiles with the Mediterranean Basin, 1200-1600: A Cost-Benefit Analysis of Comparative Advantages in Overland and Maritime Trade Routes,” \textit{International Journal of Maritime History} 11, no. 2 (December 1999): 15-30.} As captivating as these hypotheses may be, they divert attention from two very obvious, and much more influential, endogenous factors: 1) a silver-favoring Burgundian monetary policy, which propelled Central European silver into the Low Countries, and 2) Flemish protectionism, which pushed English cloth exports away from Bruges and into the open arms of Antwerp.

The Anglo-Burgundian coinage revaluations of the 1460s were significant events in the history of Antwerp’s development as a center of the European economy. Between 1464 and 1465, Edward IV of England debased English silver coinage by 20\% and gold coinage by 25\%. These debasements weakened English currency, lowering the price of English exports to the Continent. Since one of the primary English exports was woolen cloth, which competed with cloth made in Flanders, Edward’s debasements posed a threat to the Flemish cloth industry. In response, Philip the Good, Duke of Burgundy and sovereign of a semi-centralized confederation of provinces in the Low Countries (including both Flanders and Brabant), debased Burgundian silver coinage by 12.7\% and gold coinage by 3.3\%.\footnote{John H. Munro, “Monetary Contraction and Industrial Change in the Late-Medieval Low Countries, 1335-1500,” in \textit{Coinage in the Low Countries (800-1500): The Third Oxford Symposium on Coinage and Monetary History}, ed. N.J. Mayhew (London: B.A.R., 1979), 118.} Although this debasement was too small to neutralize England’s currency manipulation and increase the competitiveness of Flemish cloth, it had momentous consequences. Since Philip had debased silver coinage by nearly 10\% more than he did gold coinage, his debasements changed the official bi-metallic ratio (the ratio of the value of silver to that of gold) in the Low Countries. Silver, therefore, had a higher value and more purchasing power in the Burgundian territories than it did elsewhere in Europe, and this disparity propelled merchants who had silver to spend toward the Low Countries. Fortuitously, concurrent advances in mining technology in Central Europe, especially the discovery of the lead amalgamation process in 1451 (which facilitated the separation of silver from copper ore), greatly increased the amount of silver mined from the region. In fact, Central European silver production increased fivefold between 1450 and 1530.\footnote{John U. Nef, “Industrial Europe at the Time of the Reformation (ca. 1515—ca. 1540),” \textit{Journal of Political Economy} 49, no. 1 (February 1941): 7.} The Burgundian overvaluation of silver drew this newly mined silver into the Low Countries. Furthermore, since England’s debasements had made purchases of exported English cloth inexpensive, merchants found that purchasing English cloth with silver in the Low Countries and reselling it elsewhere was extremely profitable. Thus, the high value of silver in the Burgundian Netherlands acted like a magnet, drawing English cloth sellers and Continental buyers together.

The overvaluation of silver was an important factor in the increase in the volume of trade in the Low Countries at the end of the fifteenth century. It does not by itself, however, explain why Antwerp was able to displace Bruges as the center of the northern European economy. To do so, we must examine the response by Bruges and the other Flemish cloth towns to the influx of English woolens after 1466.

Gazing at the elaborate facades of the surviving cloth halls in Flemish cities today, one soon realizes the importance of cloth production for the medieval Flemish economy. Indeed, cloth, especially woolen cloth, was the mainstay of the region’s commercial power. This economic might was soon translated into political influence, as the immense wealth of the urban cloth-producing guilds enabled them to
manipulate civic and ducal authorities. This is illustrated by the events of the 1300s, when the guilds, in order to limit competition, were able to enforce a virtual ban on rural cloth production. From the mid-fourteenth century onward, such rent-seeking practices became increasingly common, as the guilds sought to protect their vested commercial interests.

Thus, the threat of a massive increase in English woolen imports after 1466 quickly drew a protectionist response from the Flemish cloth-producing guilds, especially from those of Bruges. A variety of protectionist measures were enacted to keep English wool cloth out of Flanders, including tariffs, embargoes, and, ultimately, ordinances that prevented Flemish citizens from wearing English cloth on penalty of confiscation of the clothing, a severe fine, or both. The English, for their part, would probably have preferred to remain at Bruges, the dominant market of northwestern Europe. But, faced with such restrictions, they sought another market in the Low Countries, and Antwerp presented itself as the obvious choice. Lacking a thriving cloth industry of its own, the city on the Scheldt lacked the incentive to imitate Flemish protectionist measures. Furthermore, its proximity to Bruges was likely to draw at least some members of Bruges’s wealthy foreign merchant community to Antwerp.

Thus, just at the moment in which Burgundian monetary policy was driving the volume of trade in the Low Countries ever higher, Bruges’s protectionism in effect cut it off from the intra-continental economy. English woolens and Central European silver bypassed Bruges for Antwerp. But, for its part, did not take this loss of trade sitting down. In 1485, for example, during one of the many Flemish revolts against the centralizing efforts of Maximilian of Habsburg, its civic militia, aided by the militia of Ghent, actually constructed a fort along the Scheldt to intercept English woolens heading to Antwerp. Antwerp’s own militia, however, destroyed the fort shortly after its construction.

The enmity between the burghers of Bruges and Maximilian of Habsburg certainly added to Bruges’s economic decline. In 1488, the citizens of Bruges, seeking a renewal of their ancient privileges and limitations on English wool imports into the Low Countries, imprisoned Maximilian until he agreed to their demands. Upon his release, Maximilian rejected the concessions and took revenge on Bruges by ordering all of its foreign merchants to transfer their businesses and residences to Antwerp. Most of these merchants would never return. Three years later, Maximilian transferred the staple in alum, a substance necessary for affixing dye on cloth, to Antwerp. By 1492, Antwerp had clearly displaced Bruges as the economic dynamo of the Low Countries. Although Bruges was awarded the staple of Spanish wool in 1493, which allowed it to limp into the sixteenth century, most of its foreign merchant community had by then already made the move to Antwerp.

The shift of economic power from Bruges to Antwerp, therefore, was not the result of an active pursuit of trade on the part of Antwerp as much as it was the consequence of Bruges’s stubborn protectionism. Had Bruges allowed English cloth imports, it perhaps may have retained economic hegemony in northern Europe for another fifty years. The oft-repeated theory that the silting of the Zwin River condemned Bruges to its fate is untenable; the silting of the Zwin was already serious during Bruges’s golden age, and, had Bruges maintained its economic hegemony, it could also have maintained

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8 For a detailed account of fourteenth-century Flemish urban protectionism, see David Nicholas, Town and Countryside: Social, Economic, and Political Tensions in Fourteenth-Century Flanders (Bruges: De Tempel, 1971).
10 Ibid., 1148-49.
the Zwin. Bruges’s worst enemy, it seems, was neither silt, nor Maximilian, nor English cloth, but Bruges itself.

Bruges’s loss in trade was, of course, to Antwerp’s gain. Antwerp received almost all of the benefits of Philip the Good’s overvaluation of silver simply by filling the gaping void created by the refusal of Bruges and other Flemish cities to allow trade in English woolens. It became the nodal point for the traffic in English cloth and Central European silver, and other commodities quickly followed: Baltic grain, French bay salt, Italian silks, Spanish leather, etc. It also established cloth finishing and herring salting and smoking industries, the latter being of considerable importance during the sixteenth century. It may even have been, as John H. Munro writes, “the decisive propelling force of the European commercial economy.” Yet despite its growing economic power, Antwerp remained merely a European entrepôt, not a global one. The turn of the sixteenth century, however, would change that.

Global Metropolis, 1501-1557

Antwerp’s transition from an axis of European, intra-continental trade to a center of global, inter-continental trade was inextricably linked to the expansion of European overseas empires and the intensification of international trade in precious metals that took place during the beginning of the sixteenth century. In particular, Antwerp’s relationship to both the Portuguese and Spanish empires and its command of the European silver and copper markets enabled it to profit from the first era of globalization and become a truly global metropolis.

In 1498, Vasco da Gama rounded the Cape of Good Hope and extended Portugal’s already extensive trading network along the west coast of Africa to its eastern coast and on to India. Portuguese trading colonies on the Atlantic islands and along Africa’s coast already supplied Lisbon with gold, ivory, slaves, sugar, and malaguette (a.k.a. “Guinea pepper”—a pepper substitute). Her new trade route to the Orient provided her with direct access to the highly coveted spices of the East: pepper, cinnamon, cloves, and mace.

Lisbon, however, was far too remote from the heart of Europe to be a successful distribution center for these commodities. In order for their spices to be truly competitive with the Venetian spice trade, the Portuguese could not wait for merchants to make the costly trek to Lisbon; they needed a base with pre-established commercial networks. For a number of reasons, Antwerp was the logical choice. First, Antwerp had well-developed trading networks, both overland and seaborne, that could connect Portuguese spices with markets throughout Europe. Second, the number of foreign merchants residing there made Antwerp a seller’s market for spices. Pepper in Antwerp, for example, could fetch prices approximately 13% higher than in Lisbon. Finally, and most importantly, Antwerp was already a clearinghouse for the two commodities essential for Portuguese trade with Africa and Asia: copper and silver.

The lead amalgamation process that had so increased the German supply of silver after 1451, and was a major factor in Antwerp’s triumph over Bruges, worked by separating silver from copper ore. As such,

\[\text{Ibid., 1137.}\]
\[\text{van Houtte, “La genèse du grand marché,” 102.}\]
\[\text{John H. Munro, \textit{Wool, Cloth, and Gold: The Struggle for Bullion in Anglo-Burgundian Trade, 1340-1478} (Brussels: Éditions de l’Université de Bruxelles, 1973), 183.}\]
\[\text{Jean Denuce, “Privilèges commerciaux accordés par les rois de Portugal aux Flamands et aux Allemands,” \textit{Arquivo Histórico Português} 7 (1909): 313-15.}\]
it not only increased the supply of silver, but also that of copper. Although it was essentially a side-product of the process, copper, being valuable in its own right, followed silver to Antwerp. Thus, Antwerp became a reservoir for both silver and copper.

As chance would have it, these two metals were more valuable than gold in Portuguese exchanges with Africa and Asia. In Africa, where gold was relatively abundant, Portuguese transactions in gold were far less profitable than those conducted in silver. Even more lucrative, however, was copper, which could be obtained cheaply in Europe but was highly prized in Africa. Finished copper goods, like bracelets or pots, proved to be some of the most valuable barter objects in the African trade. In Asia, copper was of little use, but silver was also more useful in exchanges than gold. The effects of the mid-fifteenth-century collapse of the Ming paper money system pushed China, and, subsequently all of Asia, onto a silver base. Silver prices were much higher in Asia than in Europe, while the opposite was true for gold. Thus, the Portuguese preferred to transact their African trade in copper and their Asian trade in silver. Both metals were readily available at Antwerp.

Antwerp, then, was the perfect port for the Portuguese. It offered a high supply of the metals needed to conduct profitable overseas exchanges, and a high demand for the products obtained. Thus, in 1499, King Manuel of Portugal granted Antwerp the staple monopoly on all Portuguese spices. The first Portuguese boat loaded with pepper and cinnamon arrived in 1501. Seven years later, in 1508, Manuel negotiated with a syndicate of Antwerp-based Italian merchants that agreed to buy all pepper sent from Lisbon to Antwerp at a fixed price and not sell it below a price determined by the crown. This not only supplied Manuel with a significant annual income, but also ensured that pepper prices would remain high. Thus, the sixteenth-century Italian chronicler of the Low Countries, Lodovico Guicciardini, was close to the mark when he explained Antwerp’s prosperity:

In the year 1503 the Portugales began to bring spices out of their Indias, and from Calicut into Portugale, & frō thence to Andwerp, which before that time were wont to be brought by the red sea . . . to Alexandria, & so to Venice, which (before the Portugales voyaige into the Indias) furnished all Christendome of spices. But the king of Portugale, having . . . drawne all the spices in Calicut and the Iles adiacent thervnto into his own hands, and having brought them to Lisbonne, sent his factor with spice to Andwerp, by which meanes it drewe all Nations thyther.19

Draw all nations thither it did. The English merchant community grew, since the Portuguese purchased English cloth as a barter item for the African trade. More German merchants came to Antwerp as well, both to purchase spices and to sate the voracious Portuguese appetite for silver and copper. The Fuggers’ trade in Hungarian silver provides an example of the unquenchable Portuguese demand for the metal. From 1497 to 1504, the Fuggers sent 25,599 marks of silver to Venice, while 28,473 marks were divided between Frankfurt and Antwerp. After 1504, shipments to Venice disappeared, and almost all

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15 van Houtte, “Rise and Decline,” 43.
Fugger silver was sent to Antwerp.²⁰ Italians also poured into Antwerp, both to compete with the Portuguese spice trade and to offer their financial services as bankers and moneylenders. The Venetian Senate, which had clung faithfully to Bruges as it slowly declined, finally decided to abandon that city and send its galleys directly to Antwerp in 1501.²¹ Dutch, French, Scandinavian, Livonian—nearly every European nationality—could be found on the market squares of Antwerp. In 1560, already after the beginning of Antwerp’s decline, Antwerp was inhabited by 300 Spanish merchants, 150 Portuguese, 200 Italians, around 100 each of French and English merchants, and 250 Germans.²² Based on its foreign merchant community alone, Antwerp was perhaps the most cosmopolitan city in Europe.

Antwerp could also boast of the most cosmopolitan and diverse commodity market in all of Europe. Besides goods from across Europe, exotic products from Africa and Asia could also be purchased there. When the artist Albrecht Dürer visited Antwerp in 1520 and 1521, he was given a variety of products made from Atlantic sugar, colored feathers and porcelain from India, Calcutta cloth and silk, coconuts, and myrobalans (an East Indian fruit) as gifts.²³ Almost anything, it appears, could be purchased in Antwerp.

Just prior to Dürer’s visit to the city, political developments in Europe had further extended the realm of Antwerp’s trade. In 1515, Charles, the Ghent-born grandson of Maximilian of Habsburg, was recognized as lord over the Low Countries. The next year, after the death of his other grandfather, Ferdinand, he was proclaimed King of Spain. Enormous loans taken up at the Antwerp market from German lenders (predominantly the Fuggers) also enabled Charles’s election as the new Holy Roman Emperor, Charles V, in 1519. Charles’s success would have two important consequences for Antwerp. First, the dynastic link between the Low Countries and the up-and-coming Spanish world empire would add Spain’s New World possessions to Antwerp’s already vast trading network. Second, Charles’s dealings with the Antwerp money market would establish a crucial, and ultimately fateful, financial relationship between the Habsburg prince and Antwerp lenders.

Exotic woods and dyestuffs from the New World soon became available at Antwerp. The first recorded cochineal imports to Antwerp were in 1552, although, given the importance of Antwerp’s cloth finishing industries, it is safe to presume that a portion of the first cochineal shipment sent to Spain in 1526 reached the city.²⁴ The main New World import to Antwerp, however, would be bullion. The first significant cargoes of New World metal arrived in Spain in the 1520s. Although the first shipments were predominantly in gold, silver prevailed after 1530.²⁵ As king, Charles was entitled to 20% of all treasure that arrived in Seville. However, in order to make payments on his continuously growing Antwerp loans

²⁰ van der Wee, Growth of the Antwerp Market, vol. 2, 125.
²¹ Munro, “Bruges and the Abortive Staple,” 1155.
(taken largely to finance a series of wars against Francis I of France), Charles was forced to send a significant portion of this “royal fifth” to Antwerp.  

The security of Charles’s supposedly inexhaustible supply of New World bullion made it easier for him to draw large loans at Antwerp. Increasingly, the Habsburg Empire was being run, in Karl Brandi’s words, “not on the revenues which had already been collected, but on the perpetual mortgaging of future income.” Others borrowed on the Antwerp market as well: Henry VIII, Manuel of Portugal, even Cosimo dei Medici. Given that the interest rate for most government loans drawn at Antwerp was around 12% per annum (and sometimes exceeded 20%), money lending became a popular side-business among Antwerp’s merchant class. Indeed, an increasing number of Antwerp merchants were abandoning trade in commodities and devoting themselves completely to financial pursuits.  

It should be noted here that this shift to the financial sector engendered important innovations in Antwerp that would have a profound effect on the subsequent history of finance. One such innovation was the practice of endorsing bills of exchange. By signing the back of a bill of exchange, a third party was able to become the collector. This made transferring credit among merchants extraordinarily easy in Antwerp. The discounting of bills of exchange was also significant. If bills of exchange drawn for payment on a stated date were paid early, the interest would be deducted by a certain percentage. This was later influential in the development of discount banking. John J. McCusker has also recently argued that Antwerp was influential in regard to another financial innovation, the development of printed price lists. Printed issues of both foreign exchange rate currents and commodity price currents were available to Antwerp’s merchants as early as the 1530s, making Antwerp, in McCusker’s words, “the birthplace of the business press.” Although seemingly a minor development, the fact that this price data was made available to the public was revolutionary. It provided Antwerp’s community of merchants with access to vital business information, previously kept secret by individual merchants and firms, and made transactions on the Antwerp market more efficient.

The availability of silver and copper, and the resulting lending capabilities that resulted from it, had, therefore, united Antwerp with the two great world-empires of the sixteenth century. The city became the hub of a vast trade network that, for the first time in history, encircled the entire globe. Commodities from

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around the globe were unloaded at its harbor, and its money market financed the governments of Europe and the business ventures of merchants. Its industrial sector grew as well. By 1550, no less than 19 sugar refineries were operating in Antwerp, making it the commanding European sugar supplier.33

The city had entered its golden age, resulting in a rapid increase in population. At the beginning of the sixteenth century, the population of Antwerp had been around 40,000. A half-century later that number had grown to nearly 100,000, making Antwerp one of the largest cities in Europe. The dynamic growth of the city is also evidenced by the massive construction projects undertaken by civic authorities. Between 1496 and 1585, 92 new streets and 4 new market squares were built.34

The momentum of the city was evinced in the attitudes of its citizens, who boasted of their city’s cosmopolitan character and its commercial and civic freedoms. A stone over the city’s principal gate proclaimed the city to be “for the merchants of all nations.”35 Commenting on the increasing notions of autonomy held by Antwerp’s citizenry in a letter to Cardinal Granvelle, the Vicar-General of Mechelen wrote, “It would be a very good thing to make them erase the S.P.Q.A. which they inscribe everywhere on their buildings and edifices, pretending to be a free republic, and that the prince cannot command them without their consent.”36 [The reference is to the habit of Antwerp’s magistrates to stamp documents and engrave civic buildings with S.P.Q.A., an abbreviation for Senatus Populusque Antverpius (The Senate and the People of Antwerp), an allusion to the S. P.Q.R. abbreviation (The Senate and the People of Rome) proudly used by the ancient Romans.]

The great French historian Fernand Braudel wrote that, during the first half of the sixteenth century, Antwerp was “a city as much (if not more) the true capital of the Atlantic as Seville or Lisbon.”37 Given that, already by the 1530s, it united the markets of Europe with Africa, Asia, and the Americas, Antwerp was much more than the capital of the Atlantic; it was the economic capital of the world.

The Decline of Antwerp as a Global Metropolis

Between 1501 and 1557, Antwerp was the dominant hub of the sixteenth-century world economy. Despite temporary recessions and financial crises caused by the Habsburg-Valois wars, Antwerp retained this distinction. Even during this golden age, however, a number of forces were beginning to undermine the stability of the city’s position.

The deleterious Habsburg monetary policy that plagued Antwerp throughout much of sixteenth-century was one of these forces. Throughout his reign, Charles V fought a losing battle to keep the official bi-metallic ratio stable despite the fact that massive imports of New World silver into Europe were causing silver’s value to fall in comparison to gold. Through his regents in the Netherlands (his aunt, Margaret of Austria, until 1530; afterwards his sister, Mary of Hungary), he attempted to fix the value of gold to silver by mandate. Such decrees were issued in 1521, 1527, and twice in 1539. But since the market value of gold in terms of silver was constantly higher than the decreed price, gold was either hoarded or used for purchases in France (where the value of gold and silver were closer to the market

34 Baetaens, “Le rôle d’Anvers,” 38, 45.
35 Diffie and Winius, Portuguese Empire,” 412.
price). In an attempt to stop the flow of gold bullion into France, Charles issued an ordinance in December 1541 forcing all bills of exchange in the Low Countries to be paid two-thirds in gold coin. This briefly crippled commerce, since merchants simply refused to do business in Antwerp. It soon became obvious that this provision could not be enforced, and business returned to normal (although the edict was not officially altered until 1548 and not revoked until 1551). Gold continued to pour into France, as did merchants who preferred payment in gold, which continued to become more valuable as Europe was inundated by New World silver. It is no coincidence that the economic law that explains this phenomenon, that, in the face of “bad” money, good money will be driven out, was named “Gresham’s Law” after Sir Thomas Gresham, an Antwerp-based English merchant. Indeed, Gresham wrote on December 20, 1553, “Here is no kind of gold stirring which is the strangest matter that ever was seen upon the Bourse of Antwerp having no other payment but silver Spanish reals.”

The Habsburg undervaluation of gold (or, depending on one’s point of view, its overvaluation of silver) would not have been extremely damaging to Antwerp’s economy by itself. After all, Antwerp’s growth had mainly been the result of similar policy. The difference was that the supply of Central European silver, which had previously buoyed the Antwerp economy, declined rapidly after 1535. This may not have been a problem either, had shipments of silver from Spain continued. However, since the influx of New World silver into Seville had created a large class of money-lending merchants in Spain, Charles V’s loans on the Antwerp money market diminished. Between 1551 and 1555, for example, Charles V borrowed four times more in Castille than he did in Antwerp. Thus, not only was the amount of gold in circulation in Antwerp diminishing, but the amount of silver was as well.

This decrease in silver made the city much less essential for the Portuguese spice trade. Furthermore, after the 1530s, the Portuguese could acquire the silver needed for their trade with Asia from neighboring Spain. Antwerp remained an important distribution center for spices, but the Portuguese spice trade was already on the wane. The anti-Habsburg treaty of 1536 between Francis I of France and the Ottoman sultan had allowed French ships to call at Turkish ports. By 1540, these ships were returning to Marseilles with loads of cinnamon, ginger, and other spices, which cut into the Portuguese trade through Antwerp. Renewed competition from the Italians hurt the Portuguese as well. In general, French and Italian spices purchased from the Levant were of higher quality than the Portuguese product, due both to the amount of time the Portuguese spices had to spend in the damp holds of oceanic vessels and to Portuguese price-fixing practices in India, which tended to result in an inferior product. According to one contemporary, such price-fixing was the main explanation for inferior Portuguese spices:

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40 van der Wee, Growth of the Antwerp Market, vol. 2, 159.
The Pepper that goeth for Portugale is not so good as that which goeth for Mecca, because that in
times past the officers of the king of Portugale made a contract with the king of Cochin . . . for the price
of Pepper, and by reason of that agreement . . . the price can neither rise nor fall, which is a very lowe and
base price, and for this cause the villaines bring it to the Portugales, greene and full of filthe.\footnote{Quoted in Malyn Newitt, \textit{A History of Portuguese Overseas Expansion, 1400-1688} (London: Routledge, 2005), 164.}

Furthermore, the Portuguese crown had fallen into debt to its Antwerp-based syndicate by asking for
continuous advancements on future spice deliveries. In 1549, King João III decided to cut his losses and
end the relationship with the syndicate and the city of Antwerp. Portuguese spices would continue to be
traded in Antwerp, but the Portuguese spice trade would henceforth be headquartered in Lisbon. The
elimination of one of the main pillars of Antwerp’s economy was damaging enough, but João also
announced that he would be reducing his payments on Portugal’s Antwerp debts. This severely affected
Antwerp’s financial sector.

By the beginning of the 1550s, the decrease in Central European and Spanish silver shipments and the
end of the Portuguese spice staple were beginning to severely hinder Antwerp’s commodity market. The
beginning of the end of Antwerp’s reign as global metropolis, however, would not come until 1557. In
that year, Philip II of Spain, Charles V’s son, converted all Habsburg loans to 5% annuities in the first of
several Spanish state bankruptcies.\footnote{Bindoff, “The Greatness of Antwerp,” 68.} For the lenders of Antwerp, many of whom were still being paid
interest on loans taken decades earlier, this was nothing less than a catastrophe. The state bankruptcy was
soon followed by bankruptcies of local governments, and, ultimately, of firms and individuals. The huge
bubble in the Habsburg lending market had finally burst, and the financial resources of hundreds of
Antwerp merchants had disappeared.

Another calamity would soon follow. In 1560 Elizabeth I revalued English silver, putting an end to
the favorable trade conditions that English cloth merchants had so long enjoyed at Antwerp. Three years
later, after the outbreak of the Anglo-French war, Margaret of Parma proclaimed an embargo of English
cloth, echoing Bruges’s destructive protectionism. As they had left Bruges years before, English
merchants soon left Antwerp for Emden. Although some would briefly return to Antwerp, the English
cloth trade would never be the same.\footnote{van der Wee, \textit{Growth of the Antwerp Market}, vol. 2, 228-230.} The final leg of what John H. Munro has referred to as the “tripod of
English broadcloths, South German metals and fustians, and Portuguese spices” upon which Antwerp’s
greatness rested had disappeared.\footnote{Munro, “Bruges and the Abortive Staple,” 1144.}

The international transit trade on which Antwerp’s economic power was based had ended. Some
growth would still occur in the industrial sector, but Antwerp would no longer be the global entrepôt it
once was. The next century of the city’s history reads like a tragedy. Except for brief periods of
resurgence, Antwerp continued its decline. The famine of 1565-66 set up the social conditions for the
beginnings of the Dutch Revolt. The “Spanish Fury” of 1576, in which unpaid Spanish troops ran
rampant in the city, induced its citizens to join the rebellion against Habsburg rule. Yet Alexander
Farnese’s recapture of the city in 1585 ensured that it would remain under Spanish authority. All
Protestants within the city were forced to leave, and many Catholic merchants, seeing more opportunity in
the independent Dutch provinces to the north, left as well. By 1589 the city’s population, which had been
around 100,000 in 1560, dropped to 42,000. A large percentage of these emigrants fled to the northern Netherlands, many to Amsterdam. Indeed, the influx of so many former Antwerp merchants and skilled craftsmen into Amsterdam was certainly significant in the re-centering of economic power northwards. Despite its Counter-Reformation cultural post-bloom in the beginning of the seventeenth-century, characterized by the ostentatious paintings of Rubens and Van Dyke, Antwerp diminished as an economic center. The Treaty of Muenster in 1648, which in effect closed the Scheldt to commercial traffic, was the final nail in the coffin. Antwerp would not re-emerge as a vibrant commercial port until the nineteenth century.

**IV. Conclusion**

Antwerp’s history was punctuated by monetary factors: the Anglo-Burgundian debasements, the Central European mining boom of the late fifteenth century, the increased demand for silver in Asia following the collapse of the Ming paper currency system, the discovery of silver mines in the New World—all of these influenced the city’s economic rise and fall. Antwerp was first a beneficiary and later a victim of monetary policies and global bullion structures. For roughly half a century, the city of Antwerp was a nexus for a global market in various commodities: cloth, precious metals (gold, silver, copper), spices, cochineal, sugar, etc. It connected four continents, Europe, Africa, Asia, and America, and its trade network covered a remarkable portion of the globe. Indeed, in many respects, Antwerp could rightfully be called the first truly global city. Yet despite the confident boastings of its citizens, the city of Antwerp was largely a puppet of both regional and global economic trends; it was always more acted upon than acting. Its ultimate fate resided not with the actions of individual merchants or the whims of rulers, but with the collective, insatiable, and universal hunger that we now call the market.

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Re-visualization White Nudes:
Race and Sexual Discourse in Ottoman Harems 1700-1900

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As a viable social actor, art constitutes one of many institutions participating in the creation and reification of ideologies constructed within our society. Investigating the work of Ingres, Gérôme, and others reveals striking connections between the ritual use of Europeanized women in Orientalist harem paintings and the perpetual nature of women’s social oppression. A close examination of prominent works provokes the question “why paint recognizably white women against such non-white Eastern backdrops?” Continually, visual hierarchies and prescriptive codes allow the virtual entrance of the male voyeur into the painting.

Orientalists ritually relied on popular literature to visualize the realm of Arabian Nights. Female travel writers, drawing upon folklore and captivity narratives, also became credible sources in their unique access to Muslim harems. These works fueled popular interest in the Near East, creating descriptive tropes that would later inspire art and Victorian erotic literature.

In reproducing these “oriental” tropes, artists offer the white harem for the voyeurism of the male European audience, helping create both affinity and opposition between the audience and the subject. The nature of the painting’s sexual and racial hierarchies reveals the values of the Western male, an indoctrinating structure containing subtly oppressive elements. One apparent remedy to this perpetuation lies in the work of Henriette Browne, whose deliberate break from voyeurism destabilizes Western fantasies and reinserts female agency into the harem. In examining the question of “why white women,” the issues of race and gendered desire emerge in creating specific social hierarchies and perpetuating the subordinate status of women.

The issue of white women in Ottoman harems might be answered by reviewing the history of the region. The Ottomans began trafficking in white and Christian slaves as early as the 8th century, and the trade reached its peak from 1500-1800, after the fall of Constantinople. Yet despite a prolific Ottoman traffic in white slaves as luxury goods, only 10% of all slaves held in Ottoman territories were Caucasian. Continually, Christian women made up only 5% of the total slave population, and were usually reserved as household attendants. Only the youngest and prettiest white women gained membership in the harem, making them a status symbol that only the richest pashas could afford.

These statistics blatantly contradict the implicit demographics presented by European artists—if one were to believe these depictions to be accurate, one would assume that all concubines kept in Ottoman harems were Caucasian. Clearly, artists like Ingres exaggerated the statistics to fit their own ideals regarding Ottoman harems—but why?

First, since most prominent Orientalist artists were French, they worked mainly from European models. Though some artists traveled to the Near East in search of inspiration, Muslim law prevented its
women from modeling and the entrance of unauthorized men into the harem.\textsuperscript{5} These laws prevented an accurate artistic rendering of the common Ottoman harem. In an effort to be so accurate, artists could have (hypothetically) changed the skin tone of such nudes, yet the women represented in many Orientalist works are stark white. By 1800, an aesthetic preference for white, Parisienne models arose in Paris, apparently out of growing interest in eugenics and race refinement.\textsuperscript{6} By the 1850s, the pale, “metropolitan Parisienne was often favored over the robust model of color.”\textsuperscript{7} This “metropolitan” female implicated her own wealth and class in her fairness—as dark or tanned skin became popularly associated with manual outdoor labor.\textsuperscript{8} Therefore, the fashion for pale, fair skin reflected the preference for upper class nudes in artistic representations, despite the actual ethnicities of common harem concubines.\textsuperscript{9}

Ironically, modeling in the nineteenth century became closely associated with prostitution. In popular French opinion, models who agreed to pose naked for pay were often considered lower than their “streetwalking” sisters.\textsuperscript{10} This social association placed the female nude within a complex web of visual codes—codes of status, beauty, and respectability.

A second answer to this question of white concubines lies in the values of colonialism. The visual opposition between fair white women and dark, exotic men, describes an imperial principle. Pictorially, the dichotomy created between the whitest white and the blackest black represents the fear of hybridization between European and indigenous cultures: “the separation of colonized from colonizer is required to maintain a system of power relations, …Hybridization could, potentially, erase the codes of difference established by colonialism.”\textsuperscript{11} In representing Caucasian females as members of the harem, artists like Cormon materialize the European preference for pure races.

Colonialism made painting sexualized “oriental” women difficult. The opposition created between Europeanized nudes and black servants, marks the white woman as the sexual object for the intended male European audience. As European men preferred fair-skinned nudes, the white woman automatically becomes the object of desire in her prioritized opposition to the dark-skinned woman.\textsuperscript{12} Noüy’s \textit{L’Esclave Blanche} (figure 1) illustrates the hierarchy of white and black women in the harem, as the African laundress spitefully gazes toward the indulgent white nude. The racial divisions in this painting convey both the physical and visual superiority of the white nude, in her ornamented pillows, silks, and fine porcelain. These adornments strikingly oppose the plainclothes of the African laundresses—again signifying the importance of race as a status indicator.

Aside from political and visual codes, Orientalists relied on literary tropes to construct the exotic realm of \textit{Arabian Nights}. The popular tales of Antoine Galland’s \textit{Mille et une Nuits} (Arabian Nights) of
1712 prescribed themes for later Orientalist literature. The highly sexualized themes presented in this work also reinforced standing barbaric and exotic notions of the “Orient” in the European mind. These became references for authors who would later write about the Orient, qualifying such accounts in terms of their relationship to *Arabian Nights*.

Indeed, female travel writers provided credible descriptions of the harem due to their unique access as women. The “existing discourse associated with the *Arabian Nights Tales*,” informed the women’s perceptions of the harems they visited, and “what they experienced in harems enlivened this fantasy.” Female travel writers often blended reality with the fantasy of *Arabian Nights* in an effort to make their tales more believable to European audiences, often including the writer’s own fantasies of being forced to join the sexual commune. Using the tropes of *Arabian Nights* and the popular fear of Ottoman piracy, these women fueled the “otherness” of the Orient in Western minds. Moreover, their intricate details made the account more real for readers, providing a catalyst for dreamlike entry into the scene. It was the possibility for this fantasy-entrance, and the plausibility of captive European women sexually serving the pasha, that appealed to male artists looking for inspiration in representing the harem.

In fact, striking connections appear between Ingres’ *Le Bain Turc* (figure 3), and the narratives of Lady Mary Montagu. Montagu, wife to a British Ambassador during the 18th century, traveled widely throughout the Empire and visited several harems in Ottoman regions. When delving into the substance of Montagu’s letters, the connection becomes clear:

> “…I believe in the whole there were two hundred women... The first sofas were covered with cushions and rich carpets, on which sat the ladies... all being in the state of nature, that is, stark naked... some [engaged] in conversation… others drinking coffee or [eating] sherbet, and many negligently lying on their cushions while their slaves... were employed in braiding their hair…”

This description invites artists like Ingres to virtually witness the scene. Montagu’s attention to detail augments the “reality effect,” making the narrative vividly real for the reader. By constructing this scene, Montagu becomes the surrogate masculine eye, both in her unique access as a woman and in her Westernized ideals of female sexuality, thus enabling the absent gaze of the Western male.

Victorian erotic literature also reinforced the popular notion of the Orient through captivity narratives. Drawing upon 300 years of discourse regarding Ottoman raids of Mediterranean Christian towns, works like *The Lustful Turk* outline the barbaric capture of European women, and their...
subsequent enslavement in Eastern harems. The work constructs pleasure for the reader through the “endless repetition” of descriptive sexual details, providing an opportunity for the reader to identify with the male protagonist and substitute himself into the narrative. The reader releases his awareness of reality through the seemingly “endless” repetition of details. Therefore, the pornographic narrative serves two functions: to establish and maintain an endless sexual fantasy, and, to extinguish the possible end of this fantasy by offering a pleasurable opportunity for identification between the reader and male characters.

Orientalist artists created similar endless possibilities for interaction between the viewer and harem nudes. Building upon the opportunity for sexual exchange in Le Bain Turc (figure 3), Ingres created a provocative glimpse at the plentiful flesh waiting inside the baths. The circular composition creates the endlessness of the painting itself—suggesting a never-ending supply of available nudes for the male voyeur. This composition also implies a peephole through which the viewer looks, seemingly representing the camera lens that captures these nudes. Here, the male assumes the gaze of the outside spectator—he is not a participant among the women, as in The Lustful Turk. The fantasy thus lies in the moment presumed to follow the one we witness: the moment when the male spectator enters the scene to fornicate. In this way, the nude subject in art becomes very much like the nude in the pornographic novel; both invite the same desire for participation from the male viewer.

The inclusion of the white nude in the harem creates a simultaneous identification and opposition between the intended male European audience and the Eastern subjects. European men identified with harem women in their white, “Europeanness.” The combination of this identification and the fantasy of ownership often resulted in the substitution of the European wife into the scene. Yet to heighten exotic difference artists painted “splayed legs and breast-revealing arched backs” (as in Ingres’ Odalisque and slave, figure 4)—to signify the sexual openness and indiscriminatory practices of “primitive” Eastern women. When compared to the rigid postures of corseted European women, the lazy, indulgent poses classify harem women as exotic, yet familiarly desirable in their whiteness, signifying their accessibility to the male viewer.

This dualism typifies the classic relation of the West to the East via Orientalism—in the West’s simultaneous desire to control the Orient (to “Westernize” it) and the desire to appropriate the Orient (to “Easternize” the self). Thus, the Western
male oscillates between a sexual desire to participate in the harem and a moral abhorrence to Eastern practices. The former visual identification takes shape through the sexual availability and interchangeable nature of harem women. Even if no male appears in the scene, the viewer assumes his presence and awaited return as the “absent husband.” European aristocrats also identified with pashas along class lines, in terms of the shared experience of an elite lifestyle. This affinity made substitute-identification even more feasible and realistic.

However, the representations of uncivilized Islamic practices (such as polygamy and slavery,) locate the white, Europeanized women as opposing signifiers for civilized culture. Edward Said argued that the Western creation of the Orient arises from the need to identify the self through the process of differentiation. Thus, the barbaric, backwards “other,” serves as a reference point for the civilized, positive self. As a signifier for civilized culture, the white harem woman illustrates difference for the Western male in his moral abhorrence to the barbaric, uncivilized practices of the East. Thus, the need to obliterate his Eastern counterpart and save the woman from barbarity buttresses his desire to enter the scene as an active participant. In both cases, the female nude remains subject to male pleasures and desires—an object solely for his own gratification.

These shifting relationships of identification and ownership form the basis for the Western fascination with harem scenes. The male need to possess and control female sexuality was a guaranteed privilege. If the men were artists like Delacroix, it was assumed that they had unlimited access to the bodies of the women who worked for them as models (figure 5). Nineteenth century society permitted and established boundaries for these kinds of fantasies. Recall the social link between models and prostitutes discussed earlier. In addition to professional work, models often maintained sexual relationships with the artists or commissioning men. In fact, the artist’s sexual access to the nude model, for Delacroix, was commonplace—he paid her to pose and for sex. The nonchalance with which Delacroix describes various encounters indicates his disregard for feminine agency in this area—from his journal: “Last Tuesday …a little baggage named Marie… came to pose. I took a big chance of a disease [that is; syphilis] with her.” This passage exemplifies the source for the visual pleasures of artists and male voyeurs: the nude’s release of her body to the male aggressor and her willingness to participate in the sex act. The commissioning male patron owns the nude both literally and figuratively, through the painting itself and the real-life nude therein.

Figure 5. Eugène Delacroix, *Odalisque*, c. 1825-1830. Fitzwilliam Museum, University of Cambridge, Cambridge, UK. Image available online at: http://www.fitzmuseum.cam.ac.uk/opac/search/cataloguedetail.html?&prref=2621&_function_=xslt&_limit_=10
This ownership limits the status of these mistresses to mere possessions—to be taken, sold, and destroyed at will (as in Delacroix’s *Death of Sardanapalus*). Moreover, “the painting’s sexuality is manifest not in what it shows but in the owner-spectator’s…right to see her naked.”

We may feel uneasy with such possession today, but during this period, society required the absence of female sexual agency. Nineteenth century French society considered any woman with sexual independence or agency a threat. Thus, in her assumptive gaze and blatant sexual independence, Manet’s *Olympia* (figure 6) shocked audiences and destabilized acceptable social codes. To maintain social acceptance, artists like Delacroix eliminated the possibility for female agency in their artworks. This objectification of the female form and denigration of her sexual agency served the male fantasy much in the same way it served the overall patriarchal goal. A female agent was a threat, therefore, eliminate agency and eliminate the threat.

Paintings such as *Le Bain Turc*, *La Grande Odalisque*, and *Odalisque and a Slave* all have one thing in common: the available nude and the male assumption of her sexual submission. Whether these bodies are bathed, sold, sung to, doted upon, or slain, the sexual nature of these works remains clear. For Ingres, the polygamous fantasy of endless sexual opportunity in *Bain Turc* (figure 3) illustrated the ultimate desire. His exaggerated paintings continually rendered the female subject to the male erotic gaze, objectifying the body and stealing any identity or agency she might hold.

For Gérôme, the assertion of masculine power emerges in *Slave Market* (figure 7). Here, Gérôme alienates the “barbaric Orient,” ultimately revealing two related power structures: men over women, and the white man over “inferior, darker races.” The estrangement of the “barbaric” Orient allows the European male to “morally distance himself from his Oriental counterparts,” while he is simultaneously invited...
to identify with them (in the visual possession of the nude). The painting thus circumvents any possibility of female agency by relying on her object-like status to convey sexuality.

One apparent hope for desexualizing harem scenes lies with female artists. In painting clothed women in the baths, Henriette Browne effectively breaks the voyeuristic gaze by emphasizing her own presence as a spectator in *Une Visite* (figure 8). This emphasis breaks the artist-as-voyeur position and confronts the West’s “fantasized relationship to the Orient as other.” Browne presents the harem as a domestic space that is “shaped by the women who live there,” and “minimizes the importance of the absent husband” as a visual entry point. Including a child in the portrait emphasizes the network of female relations within the harem, “diluting the sexual charge of the harem location… [and] displacing the all-powerful [father] figure on which Western identifications depend.”

Likewise, Browne’s depictions fail to conform to Western prescriptions for the harem. The discrepancy between Browne’s works and those of male artists must therefore signal a purposeful departure from objectified female and toward a reinsertion of female agency in the harem.

Therefore, investigating the work of these artists reveals striking connections between the ritual use of Europeanized women in Orientalist harems and the perpetual subordination of women. The question of “why white women?” in these paintings provokes several answers; all seeped in politics, social codes, and visual standards for race and beauty. Popular literature, contemporary colonial politics, and *Arabian Nights* provided a discourse that inspired artists constructing the harem. In reinforcing “oriental” tropes, Ingres, Gérôme, and others offer the white harem for the male European voyeur, creating both affinity and opposition between such audiences and the subjects represented. A feminist reading of these issues divulges the underlying oppression for women in Orientalist harems, making such an analysis central to the perpetual nature of women’s social oppression. When a woman creator has the power to subvert the voyeurism of Orientalist paintings, the question of “why white women?” evidently
pertains only to the sexualized, identifiable, and passive harem girls created for the viewing pleasure of men, and only men.

In recognizing the importance of female agency, we must therefore continually seek to identify hidden oppressive actors and institutions in society. Such identification is the necessary first step to reform and reconstruct subordinating social factors, and reclaim women’s historical agency.46

1 The word “harem” is used here to describe the group of women kept as sexual mistresses for sole use by a Muslim man. A man wealthy enough to afford such a group of mistresses in history usually occupied a position of social or political status. However, in common English translation, the word “harem” can refer to both the women themselves and the house or part of a house where such women were kept.


3 Ibid.


7 Marie Lathers, Bodies of Art, 41. Lathers’ use of the term “medicalized” implies the anatomical perfection preferred in Parisienne models during the nineteenth century. This association, when looked at in context of today’s contemporary preferences for physically flawless women, reveals the emergence of the modern standard of beauty.

8 Joan DelPlato examines the class-linked hierarchies represented in Orientalist harems as well as many other aspects of harem paintings in Multiple Wives, Multiple Pleasures: Representing the Harem, 1800-1875 (Cranbury, NJ: Associated University Press, 2002), 27 et al.

9 Marie Lathers, Bodies of Art, 34-39.

10 Ibid., 46. Lathers discusses the association between the two professions in relation to documentary photography of the time, citing Amaury-Duval in reference to a model’s low class status: L’Atelier d’Ingres: Souvenirs, edited by Daniel Ternois (Paris: Arthena, 1993), 74.


12 Reina Lewis, Gendering Orientalism, 172. Carol Ockman also discusses sexuality as it becomes the “linchpin of gender and ethnicity” in Ingres’s Eroticized Bodies: Retracing the Serpentine Line (New Haven, CT: Yale University Press, 1995), 83.


15 Ibid., 183, 186. Roberts quotes one such passage from Annie Jane Harvey’s Our Cruise in the Claymore with a Visit to Damascus and the Lebanon (London: Chapman and Hall, 1861), 83.


17 Ibid., 188.

18 Roger Benjamin, in “Ingres Chez Les Fauves,” Art History 23, no. 5 (2000): 753, discusses the importance of inspirations such as Montagu on working artists like Ingres, citing that the borrowed subject was even evident
Gautier in 1867. Continually, this phenomenon appears in the work of Meyda Yegenoglu, whereby the author discusses the inherent masculinity of the subject position that female travel writers occupy “vis-à-vis the Orient and its women,” in Colonial Fantasies, 91.

19 Lady Mary Wortley Montagu moved with her husband, Edward Wortley Montagu, British ambassador to Turkey, in 1716. She lived there for two years and recorded her experiences through correspondence, later published. See Robert Halsband, ed, The Selected Letters of Lady Mary Wortley Montagu (London: Longman, 1970).

20 Robert Halsband, Selected Letters, 91.

21 In fact, Ingres never traveled to the East at all. See Gerald M. Ackerman, “Gérôme’s Oriental Paintings and the Western Genre Tradition,” Arts Magazine 60 (March 1986): 75-80.

22 Meyda Yegenoglu, Colonial Fantasies: Toward a Feminist Reading of Orientalism (Cambridge: Cambridge University Press, 1998), 90. See also Reina Lewis, Gendering Orientalism, 146.

23 Mary Roberts, “Contested Terrains,” 188. See also Frederick N. Bohrer, Orientalism and Visual Culture, 13.


25 Steven Marcus, The Other Victorians, 217, 215.


27 Ruth B. Yeazell cites the relationship between Rowlandson’s satirical cartoon and Ingres’ Le Bain Turc in Harems of the Mind, 249; more specifically, the obvious influence of Rowlandson’s satire on Ingres’ revered work.

28 John L. Connolly, Jr. also addresses this concept in “Ingres and the Erotic Intellect,” in Woman as Sex Object, 17.


30 Patricia A. Morton, “National and Colonial,” 368.


32 Reina Lewis, Gendering Orientalism, 156. Mulvey qualifies the identification of the male spectator to male protagonists in narrative cinema through the tenets of psychoanalytic formations of the ego; see “Visual Pleasures and Narrative Cinema,” 18.

33 Ruth Bernard Yeazell, Harems of the Mind, 2.

34 Again, the reader is reminded of the stories abound in The Lustful Turk, Arabian Nights, and the descriptions of Lady Mary Montagu and other female travel writers regarding the harem. Continually, the statement by Montagu that her tales must, in a way, conform to popular standards of the Orient reinforces this notion of the ordinary harem. See note 15.

35 Meyda Yegenoglu, Colonial Fantasies, 87.


38 Ibid.

39 Eugene Delacroix, Journal, 1822-1863, edited by André Joubin (Paris: Plon, 1996), March 31 1824, and October 22 1822; cited in Marie Lathers, Bodies of Art, 54. Translation from Lathers. Lathers further discusses the relationship between models and prostitutes, stating that models had difficult times procuring stable work, and often relegated themselves to prostitution when work no longer steadily appeared. She continues by quoting Paul Dollfus, [Modèles d’artistes (Paris: Marpon and Flammarion, 1888), 13] stating that the modeling profession often acted as a buffer between the working-class woman and the prostitute—usually in that it worked to facilitate this final “fall from grace” (55).

40 Linda Nochlin, “Eroticism and Female Imagery in Nineteenth Century Art,” in Woman as Sex Object, 14.

41 Ibid., 156.

42 Ibid.

43 Reina Lewis, Gendering Orientalism, 162.

44 Ibid., 156.

45 Ibid.
Finding the ‘I’ in Imagination: “Kubla Khan” as the Solution to the Problem of the Individual in Coleridge’s The Rime of the Ancient Mariner

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The Rime of the Ancient Mariner is commonly read as a poem extolling the graces of Christian hospitality. Once the Mariner “inhospitably killeth the pious bird of good women,” both the reader and the Mariner are barraged with a catalogue of suffering that is only lifted when the Mariner finally learns to praise even that which is foreign to him. The result is a poem that, read in this fashion, seems guilty of overt moralizing, even though it claims to legitimize that moralizing through its presentation as an archaic ballad. Samuel Taylor Coleridge was, in spite of his fanatical devotion to science and metaphysics, a self-proclaimed Christian, and it is certainly not difficult to be persuaded that the ballad’s meaning is to be found entirely within the words of the 1817 version’s final marginal gloss: “And to teach by his own example, love and reverence to all things that God made and loveth” (614-617, gloss). Indeed, Coleridge apparently calls for both his Mariner and his readers to become participants in his notion of the One Whole. Yet the very nature of this ending to The Rime introduces a paradox with the basic tenets of Romanticism. How are we to resolve this belief in collectivity as a property of the divine with the Romantic trust in the imaginative power of the individual?

When we read The Rime with this concern for the individual in mind, it becomes disturbingly inadequate. David Mao offers a fascinating interpretation of the poem, claiming that The Rime is a poem about imagination and fancy, as well as Coleridge’s ambiguity of belief in the supernatural. As opposed to reading the slaying of the albatross as an act of inhospitality, Mao sees the killing of the bird as the triumph of the imagination. In this act, he claims the progress of poesy is rewritten “as the destiny of a single human being,” the mariner representing a new order of poetic imagination that does not require the fancy of the supernatural (84). The albatross, linked as it is with the Polar Spirit and the other fantastic elements of the poem, is seen as emblematic of this realm of the supernatural.

What is particularly appealing to me about this reading is that it provides an answer for the problematic question of why the Mariner shoots the albatross in the first place. Coleridge’s good friend William Wordsworth found fault in the poem, asserting that the Mariner “does not act, but is continually acted upon” (Mellor and Matlak 698). Yet the Mariner is apparently exhibiting a bewildering case of unrestrained action when he kills the albatross; an examination of the lines leading up to the shooting offers no logical reason for this act. However, if we view the Mariner in his metaphorical capacity as a representative of the poetic individual, the murder can at least make some sort of symbolic sense, much more than characterizing it as the mere result of unmotivated inhospitality.

There is ample evidence supporting this reading of the Mariner as a poet himself. As David Wilkes has noted, Part Four of The Rime contains a condensed version of the poetic composition process
which Wordsworth described in “Tintern Abbey” (203). The sight of the sea worms, seen as something beautiful, releases the Mariner’s soul into its capacity for poetic praise:

O happy living things! no tongue
Their beauty might declare:
A spring of love gusht from my heart,
And I blessed them unaware!
Sure my kind saint took pity on me,
And I blessed them unaware.

The self same moment I could pray;
And from my neck so free
The Albatross fell off, and sank
Like lead into the sea. (Rime 286-95)

This is a moment of inspiration for the Mariner, and that inspiration is followed by transcendence. Yet this inspiration appears to have occurred at an unconscious level. We are told that he blesses the snakes “unaware,” and, as if the fact is particularly important, we are told so again. It is important that this blessing is preceded by the notion that “no tongue/ Their beauty might declare”. The word “might” is especially noticeable. It is not the case that no living soul can declare the beauty of the water snakes, but instead the possibility that no one actually will do so seems to be cause for concern. This recognition, the idea that the wonder of the water snakes is a mystery that no mortal has bothered to unlock, is the notion that prompts the Mariner’s unconscious blessing. The parallel with the early stanzas of “Tintern Abbey” is striking. In Wordsworth’s poem, after the poet depicts the beauty of the natural scene that surrounds him, he comments on the way in which the memory of the beauty has affected his life, even after years away from the geographical point featured in the poem: “Though absent long,/ These forms of beauty have not been to me,/ As is a landscape to a blind man’s eye” (“Abbey” 24-6). Wordsworth assigns the credit for his sublime poetic ability to the influence of the natural scene of the cliffs. What is of even more interest is the way that this beauty is similar to the “unaware” blessings of the Mariner. Wordsworth asserts that the natural forms are responsible for “feelings too/ Of unremembered pleasure; such, perhaps,/ As may have had no trivial influence/ On that best portion of a good man’s life” (“Abbey” 31-4, my emphasis). While Wordsworth acknowledges that the secluded cliffs of his poem have had a profound impact on his existence, he also demonstrates that much of that impact has occurred at an unconscious level. It is this unconscious appreciation of the natural object that inspires both poetry and praise, and it is a quality that the Mariner and the speaker of Wordsworth’s poem appear to share. Wilkes points out that much like his counterpart in “Tintern Abbey,” the Mariner becomes “a sadder and a wiser man” once his soul is able to comprehend both the beauty of nature and human truth (204).

Anne Williams argues that The Rime demonstrates the process by which the individual subject is asserted. In her words, it “concerns not the creative Imagination so much as the creation of Imagination” (1115). In other words, this is an early step taken by Coleridge to assert the poetical possibility of the individual soul. Even so, this new imagination is punished due to that very association with a single being – something that destroys the common bond between life and world and compromises the integrity of the One Whole (Mao 89). Cosmic order asserts its superiority over the Mariner, forcing the abandonment of
individual genius. The final outcome can then be seen as Coleridge’s discomfort with the power of this genius, as the Mariner is doomed to repeat forever his brush with individuality to passers-by as penance for the act itself.

I wish to argue that Coleridge does achieve a resolution of the paradox that plagues his Mariner, and that the resolution is found in “Kubla Khan.” Of course, the issue is somewhat murky; both “Kubla Khan” and the initial version of The Rime were composed in 1797, and in spite of the rather precise placement of “Kubla Khan” in the summer of 1797, it is difficult to say which poem was written first, or even to conclude whether or not their compositions overlapped. Even so, the unique situation of “Kubla Khan” as a fragment produced in a hallucinatory state allows for the possibility that Coleridge may have been adopting a view of imagination he would not otherwise be ready to employ. Thus, I propose that “Kubla Khan” does what The Rime cannot – celebrate the imaginative potential of the individual.

Coleridge’s own theory of imagination demonstrates his belief in imagination as a necessarily self-conscious act: “The primary IMAGINATION I hold to be the living Power and prime Agent of all human Perception, and as a repetition in the finite mind of the eternal act of creation in the infinite I AM” (BL 749). The Imagination is a power whose perception gives the subject a sense of their own identity. The subject is then able to re-cast the world in its own image (Williams 1124). It is this power, adopted by the Mariner, which Coleridge is apparently unable to sustain in The Rime. There can be little doubt that the Mariner is exhibiting this power in his killing of the albatross. As Williams astutely points out, the Mariner actually uses the pronoun “I” for the first time in this act – “I shot the ALBATROSS” (Williams 118; Rime 82). The violence of self-recognition is here depicted, with disastrous consequences for both the natural world and the Mariner himself. The two forces, imaginative individual as enactor of the world, and also the autonomy of the world itself, are placed in opposition to each other, resulting in a struggle over the power to make meaning. In this instance, it is the individual who proves the weaker. The world of order, represented though it may be by the supernatural, thrusts itself upon the Mariner, forcing him to abandon his briefly held position as composer of the world around him. This superiority attributed to the fixed nature of order is curious given Coleridge’s own literary theory. He saw poetry as a way to unify reason and the senses, and to stimulate the imagination to an awareness of its own self-conscious nature (Wheeler 17). Yet it cannot be denied that the Mariner is indicted precisely for his attempt to exalt that self-consciousness. Interestingly, this feature of Coleridge’s ballad is noticeably un-Romantic. “One of the constitutive and motivating features of English Romantic poetry,” Peter Hühn says, “is an unprecedented degree of self-consciousness accompanied by a marked tendency to self-analysis and the emergence of a distinct selfhood alienated from others and threatened in its existence” (230). The dramatic action of the poem, in the isolation of the Mariner both geographically in the Antarctic and socially as an outcast of his shipmates, certainly adheres to this aesthetic, but the problem is found in the resolution. The Mariner must reintroduce himself into the world he has removed himself from, fixing himself once more as a passive character subject to, not enactor of, the order of things around him. He must relinquish his position as a composer, even in his capacity as a continual storyteller, for the story he must repeat again and again is merely one of narrative relation as opposed to one of poetic composition.

Lawrence Venuti offers the following as a definition of the Individual in Romantic poetry: “the concept of the human subject as a free, unified consciousness that transcends the epistemological limitations of biography and history and is the origin of meaning, knowledge and action” (163). Why,
then, does *The Rime* seem to chastise itself for attempting to embrace this concept? There are two answers to this question, found in those forces synonymous with taboo, politics and religion.

Peter Kitson reads *The Rime of the Ancient Mariner* as the result of Coleridge’s loss of faith in political action, a reading he feels is demanded when considering the work in the context of Coleridge’s earlier writings (204). Coleridge devoutly believed in the intersection of politics and poetry, and his early works were conscious efforts to invoke social change. However, by the time he wrote *The Rime*, Coleridge had become disillusioned with politics, specifically with the French Revolution. He was also deeply conscious, though, of a guilt suffered by his own country. He believed that Great Britain’s collective guilt was a reflection of the shared Original Sin (Kitson 205). The power of the individual, viewed in this context, becomes something dangerous as well as enlightening. There is an element of guilt apparent in the individual’s removal of self from the community, and this removal will eventually prompt shame and disgrace, as we see in the Mariner’s punishment of wearing the albatross around his neck. The Mariner can only relieve himself of this shame by reinserting himself in the community through an acknowledgement of his fellow creatures, namely the blessing of the water snakes. The shame pictured here is representative of that felt by Coleridge himself. As a philosopher who considered himself deeply religious, Coleridge viewed as a crime his own belief and encouragement in mankind to improve itself without the aid of grace (Kitson 205).

Along with the loss of faith in political action, the reasoning behind Coleridge’s refusal to embrace the imaginative power of the individual no doubt also lies in his devotion to ensuring the place of religion in his philosophical treatises. While he would never deny the necessity of metaphysics, he felt that the Christian vision was not something defined categorically, but instead something transcendent (Hedley 134). The ultimate goal of Coleridge’s poetics is not an ability to see and paint the world, but a recreation of the self in the order of the divine. In *The Rime*, though, this ascension is only achieved through an engagement in the usual notion of Christian charity. Rather than the transcendence being an exaltation of the self, it is in the recognition of the fallibility of the individual, pictured in the end as a penitent sinner. The concept of Original Sin necessitates a division between the divine and the individual, and Coleridge’s adherence to Christianity as a founding principle of his philosophy engenders the paradox of the poem. Any poem, in fact, composed as an exploration of the divine qualities of the self while confined to an acceptance of the fallibility of man will result in this paradox.

However, in the production of “Kubla Khan,” Coleridge is able to throw all guiding principles aside. As he states in his prose headnote to the poem, he views the work not as a production resulting from his own poetical philosophy, but instead as a work of art that he seized from the hazes of a vision:

> The author continued for about three hours in a profound sleep, at least of the external senses, during which time he has the most vivid confidence, that he could not have composed less than from two to three hundred lines; if that indeed can be called composition in which all the images rose up before him as things, with a parallel production of the correspondent expressions, without any sensation or consciousness of effort. (*KK*, headnote)

Regardless of whether or not the words above are entirely truthful, what this headnote allows Coleridge is a remarkable amount of freedom. Any departure from his usual notions of philosophy or religion is excused, because by the poet’s own admission this is not the work of the poet himself. Thus, the
obstacles that hampered the ultimate fulfillment of the self as divine in *The Rime* are surmounted, and the imaginative power of the individual is celebrated without any boundaries.

One of the ways that “Kubla Khan” is able to achieve this is by reinventing the way source material for poetic inspiration is treated. According to Peter Kitson, *The Rime of the Ancient Mariner* “shows the progress from motiveless sin to individual redemption achieved through the agency of natural forces ‘impregnated’ with the divine” (207). While I do not necessarily agree with the argument that the Mariner’s sin was completely motiveless, it is clear that he finds redemption through his recognition of the divine properties of the water snakes. The water snakes are divine in their very association with the natural world and the One Whole, and the Mariner has to reinsert himself into this order so that his sin may be forgiven. There is an effort made to unify the individual with the source for inspiration, rather than depart from and build on it. While the Mariner’s poetic act is an act of association and collectivity that compromises the concept of the individual, the speaker of “Kubla Khan” enacts a complete removal from the object that provokes his poetry. The counterpart to the water snakes, which provide the Mariner with the object for praise, is found in Coleridge’s source material for “Kubla Khan,” the book the poet left open on his lap as he succumbed to his drowsy hallucinations: *Purchas’s Pilgrimage*. In the Mariner’s case, the object is already invested with divine properties, and it is simply a matter of unmasking those divine properties to allow the capacity for praise, even if that act of unmasking does occur at an unconscious level. In “Kubla Khan” there is no unmasking, for there are no divine properties in the words of *Purchas’s Pilgrimage* before Coleridge actually places them there; in this latter case, the divine inspiration finds its origination in the poet himself, rather than the object. According to Venuti, the act of poetic composition in Coleridge’s theory occurs when the poet spontaneously sympathizes with his text (164). As we can see, the manner in which this sympathy occurs depends greatly on the role of the individual in the poem. While in *The Rime* the poet is humbled, recognizing his own inability to function as a creator of meaning as opposed to a discoverer of it, “Kubla Khan” demonstrates a belief in poetic genius that can spring forth from the internal senses.

An examination of “Kubla Khan” allows us to see how Coleridge relies on individual genius to reinvent the object of the poem, namely the following sentences from *Purchas’s Pilgrimage*: “Here the Khan Kubla commanded a palace to be built, and a stately garden thereunto. And thus ten miles of fertile ground were inclosed (sic) with a wall” (KK, headnote). Coleridge takes these words and transplants them metaphorically into the arena of the individual mind, where poetic genius is allowed to run its course in reconstituting the prose into poetry. Just as *The Rime* is often read as a metaphor for the composition process, so has “Kubla Khan,” and it is a fairly common critical approach to do so. The manner of self-referentiality in “Kubla Khan,” while evidently present, is an extremely complex one. The speaker of the poem does focus on himself in his poetic role, but he manages to disguise this self-referentiality while simultaneously thematizing it (Hühn 234). This act of disguising is achieved in the treatment of the composition process as a landscape, one that actually represents the human mind. The traditional manner of reading the poem is to see it as a reconciliation of opposites (Schneider 69). While it is true that a reconciliation of the disparate elements of the poet is achieved, to read “Kubla Khan” with only an appreciation for the way the poet synthesizes the contrasts severely limits any understanding. The key to unlocking the meaning of the poem in its representation of the composition process is to read the successive stanzas as first a consideration of the object, then the work of unrestricted imagination, and at last the reassembly of the object as poetry based on the imagination.
The first stanza allows for a consideration of the words Coleridge was left to ponder as he drifted off into his “profound sleep.” Lines 1-11 do little to reconstitute the source material, although they do extend on it. However, whatever extensions are made do not compromise the original intention of the source; they merely serve to paint a fuller, more recognizable picture of the object that the poet is to reconstruct into poetry. This initial instance of the creative process is one in which the artist’s significance is downplayed. This first stanza can be read as the positive counter-model to what follows. The creator of the landscape, the artist, Kubla Khan, is mentioned only once. The emphasis is on the material work that “comes into being.” Because of the focus placed on the artwork, there is no question of subjectivity or self-consciousness on the part of the artist (Hühn 235). This first part of composition is the process of “arranging and ornamenting” (Chayes 8). The material object is dominant, because the artist has yet to assert himself. This state, interestingly enough, is actually the state to which the Mariner returns at the end of his poem, once he has blessed the water snakes. Here, though, the precedence of the ordered world is only temporary.

The artist begins to function in the second stanza, in which the imagination is unleashed. Here, we have the first instances of an extension of creativity that goes beyond Purchas’s Pilgrimage. The fountain described in this stanza may be Coleridge’s concept of the primary imagination, while the “sacred river” that is “flung up” by the fountain may be the secondary imagination (Chayes 10). As noted earlier, the primary imagination is an act of self-consciousness, and, just as observed in the Mariner’s killing of the albatross, that self-consciousness can be an act of violence. This seems to support such a reading of the fountain, which violently enters the landscape: “A mighty fountain momently was forced” (KK 19). While the primary imagination is important in its initial separation of the poet from the surrounding world, the true ability for reconstitution of the natural world as poetry is found in the secondary imagination. In the Biography Literaria, Coleridge defines the secondary imagination as a power that “dissolves, diffuses, dissipates, in order to re-create” (750). While the fountain provides the foundation for the imagination, the task of changing and shaping the landscape is up to the river. Just as a literal river shapes the surrounding landscape in its effort to carve a path out of rock and soil, this figurative river reorders the vision of Kubla Khan’s garden.

While the imagination is now present in the poem, the speaker has not yet achieved the final recreation of the world in his own image that marks him as a poet of individual genius. This is found in the third stanza, during which the forces of the conscious will reconstitute the unbridled imagination into poetry (Chayes 16). Here, the river of imagination and the pleasure dome of the object world intersect in meaningful fashion: “The shadow of the dome of pleasure/ Floated midway on the waves” (KK 31-2). Not only do the forces come together, but an aesthetic consciousness emerges about the function of the images in the first two stanzas (Wheeler 20). The stanza concludes with the following couplet: “It was a miracle of rare device,/ A sunny pleasure-dome with caves of ice!” (KK 36). The speaker is aware not only that the effect created here is “rare,” but that it is indeed a “miracle.” The composition of poetry that is achieved here is, according to the poet himself, nothing less than divine. Yet, unlike in The Rime of the Ancient Mariner, the divine inspiration came solely from the poet.

The resolution here is a recognition of the poetic power of the individual, and the reluctant nature of The Rime is thrown aside as Coleridge fully embraces this concept. Whether or not “Kubla Khan” actually represents the triumph of the individual, however, is difficult to say. There will always be the headnote reminding us of Coleridge’s supposed discomfort with the poem. Perhaps The Rime represents
a sober examination of individual genius, while “Kubla Khan” presents us with a reckless, unrestrained look at the power of the individual with no regard for the consequences. There may always be an inherent contradiction in the Romantic ‘I’ and Coleridge’s belief in the all-encompassing One Whole, and it may be that the contradiction is an impossible one to resolve. For while the poet in “Kubla Khan” does achieve an ultimate reinsertion into the natural landscape of the object world, the concluding lines of the poem leave us with the uncomfortable notion that the manner in which he has done so is actually nothing other than blasphemy:

And all should cry, Beware! Beware!
His flashing eyes, his floating hair!
Weave a circle round him thrice,
And close your eyes with hold dread:
For he on honey-dew hath fed,
And drank the milk of Paradise. (KK 49-54)
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The Effects of the Condemnation of 1277

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There are three primary stances regarding the relationship between science and the church in the middle ages. Concerning the condemnation of 1277, Pierre Duhem argues that (A) 1277 marks “the birth of modern science.”1 Edward Grant and Richard Dales, among others, argue that (B) 1277 led to an “intellectual climate.”2 Conversely, a wide-ranging group of scholars beginning in the seventeenth century (including Condorcet, and Voltaire) have endorsed a “warfare thesis,” claiming that (C) the church is responsible for the “dismal state of medieval science.”3 I shall argue that A, B and C all prove to be inadequate. In the tradition of Locke and Hume, the criterion by which the arguments are adjudicated shall be the evidence found in primary sources. After all, “A wise man…proportions his belief to the evidence.”4 In the spirit of Duhem’s original thesis, I shall narrow the focus to the effects of the condemnation of 1277 in Paris.

In a recent article, David C. Lindberg points out a lapse in the historiography of medieval science concerning the role of the church. He writes, “…the response of professional historians of medieval science has been curiously muted. We all acknowledge (when pressed) that there was a Christian context, and we deal with it when we must, but in general the community of historians of medieval science has, since Duhem, steered a course away from religious issues.”5 In response to Lindberg, the goal of this paper is not only to refute A, B and C, but also to offer a fair appraisal of the relationship between science and the church in regards to 1277. While one may argue that Edward Grant has stripped Duhem’s thesis of its implausibility, thus nullifying any controversies that may exist amongst scholars, I shall argue that Grant’s thesis is thus rendered innocuous. Further, I shall argue that Grant’s thesis largely ignores the negative effects of 1277, while C fails to account for legitimate contributions made by the church to the progress of medieval science. Thus, in response to Lindberg’s remarks, I will: 1) render the arguments presented by Duhem, Grant, and White inadequate, and 2) present a new thesis, claiming that the effects of 1277 were narrow and largely ignored.

I. Against the Duhemean Position

While Lindberg’s remarks may seem like an over generalization, and he admits as much, one would indeed be hard pressed to find a work more thorough and complete regarding the relationship between science and the church in the middle ages than Duhem’s *Etudes sur Leonard de Vinci*. Thus, one might reasonably question how exactly Lindberg’s concerns amount to a problem. Further, one might

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4 Hume, David.
5 Ibid, pg. 68.
point out, as Hans Thijssen has done, that few current scholars seriously endorse Duhem’s thesis (noting that Edward Grant perhaps comes closest). However, Duhem’s thesis is not only bold, but it is unjustified given the evidence. Moreover, it has yet to be adequately refuted and replaced by a more cogent thesis.

In the historiography of medieval science, Pierre Duhem’s work was seminal, legitimizing medieval science as a “serious academic discipline.” Grant refers to Duhem as the “eminent historian of medieval science.” Writing on the condemnation of 1277, Duhem presents the following claim:

…They impressed on scholastic science, in France as well as in England, a new orientation that obliged it to deviate from the Aristotelian tradition at many points…If we must assign a date to the birth of modern science, we would without doubt choose this year 1277…

While Duhem’s influence may be fading as medieval works continue to be translated and become more widely available, the debate is far from over. In response to the “warfare” thesis, which was reasserted in Bertrand Russell’s Religion and Science (1935), Christian apologists such as Stanely Jaki have rushed to Duhem’s defense. The debates have generally been decided by personal opinion, each side pushing an agenda. Opinion, however, should carry little weight in the history of the philosophy of science. Accordingly, it is the purpose of section one to refute Duhem’s central claim by using a defined set of criteria.

If Duhem’s claim that 1277 ought to mark the birth of modern science is correct, then a series of questions arise. First, what is modern science? Second, what separates it from pre 1277 science? And finally, why 1277? It seems that if 1277 does in fact mark the birth of modern science, then one could reasonably expect to find several occurrences in the years immediately following 1277:

1) Widespread effects, resulting in
2) Change in scholarly thought (perhaps, a fortiori, leading to the rejection of Aristotelianism), and
3) Signs of significant advances and progress.

After all, the birth of modern science ought to be marked by notable advances in thought and methodology. For the date to mark the birth of modern science effects must have been both significant and widespread. Otherwise, Duhem would clearly not regard it as such a monumental date. Further, the changes must result in marked differences, thus the “birth” of modern science. However, we instead find quite the opposite. Though not arguing against Duhem, Dales elucidates the point by writing:

…These condemnations were limited to Paris in their application although they seem to have exerted some influence on English thought as well. Secondly, condemning a view is not the same as abolishing that view. And finally, and most important, no European thinker to my knowledge

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7 Ibid
10 Lindberg, pg. 68.
had yet proposed the kind of cosmos in which the motions of the heavenly bodies could be accounted for adequately as being natural.\footnote{Dales, pg 546.} If these criticisms can be supported, then they would certainly prove devastating to Duhem’s claim.

In order to reject the first claim that would be expected if Duhem’s thesis were indeed correct, we need to look no further than the actual writings of the bishop of Paris, Etienne Tempier. On the 18\textsuperscript{th} of January 1277 Pope John XXI wrote to Tempier requesting that he investigate rumors of heresy. Six weeks later, on the 7\textsuperscript{th} of March, Tempier published his list of 219 condemned propositions. However, on the 28\textsuperscript{th} of April 1277 the Pope wrote a follow up letter to Tempier, the “\textit{Flumen aquae vivae}.” But, as Thijssen points out, “this letter gives no indication whatsoever that the pope knew about Tempier’s action.”\footnote{Thijssen pg. 2 of 8.} It may very well be that Tempier acted autonomously. Further, Tempier’s personal characteristics must be taken into account. John Wippel characterizes Tempier by pointing out that he “was not noted for his moderation,” and that the Papal Curia was “reputed to be more merciful.”\footnote{Wippel, John F. “The Condemnations of 1270 and 1277 at Paris” The Journal of Medieval and Renaissance Studies 7 (1977), pg 186.} Thijssen describes Tempier’s actions as “overzealous and hasty.”\footnote{Thijssen, pg. 2 of 8.} Given such evidence, it should begin to seem plausible that any effects that 1277 may have caused were more isolated than Duhem would have us believe. Further, the condemnation ought not to reflect the attitude of the church as a whole but rather, the over zealous disposition and intolerance of a single bishop in but one city. Accordingly, it is difficult to imagine that the condemnation launched the birth of modern science.

Moreover, 1277 was not the first condemnation in Paris. The works of Aristotle were first banned in 1210 and again in 1215, but as early as the 1240’s the works of Aristotle were a regular part of university curriculum.\footnote{Wippel, pg. 172.} Thus, the banishment of Aristotelian thought was, at least in Paris, commonplace. It is hard to take seriously decrees that are frequently ignored and rarely enforced. Why does Duhem insist that 1277 mark the birth of modern science and not 1210 or 1215? Would it not be reasonable for a scholar of the time to believe that Aristotelian thought would resurface and that the decrees would once again pass without serious implications on scientific thought? Taken in a broader scope, there were approximately fifty cases of academic related judicial proceedings in the thirteenth and fourteenth centuries.\footnote{Courtenay, William J. “Inquiry and Inquisition: Academic Freedom in Medieval Universities” Church History Vol. 58, No. 2 (Jun., 1989), pg. 170.} While \textit{prima facie} this appears to be a staggering figure, it amounts to no more than one such case every four years. Moreover, the effects were not centralized and thus magnified, but were rather spread across the whole of Western Europe.

Even more convincing is that one would expect to find a significant change of thought in the years following 1277, but it is less than clear that this is indeed the case. Largely focused on Aristotelian natural philosophy, the condemnation was a response by the bishop to rumors of heresy.\footnote{Though the targets of the condemnations are not explicitly identified, it is clear that they are directed towards the arts faculty in Paris for disseminating Aristotelian views.} The works of Aristotle, recently translated from Greek to Latin, had become entrenched in medieval thought in the years prior to 1277. However, such works often indirectly implying that God’s powers are limited, were
viewed as heretical by the church. Among the 219 condemned propositions, proposition forty-nine is of particular importance. It reads, “That God could not move the heavens with rectilinear motion; and the reason is that a vacuum would remain.” Undoubtedly, this is aimed at Aristotle’s argument, which held that a void was impossible. Duhem argues that the denial of this argument ultimately “liberated Christian thought from the dogmatic acceptance of Aristotelianism.” And prima facie, this seems plausible.

However, even when God’s absolute powers were acknowledged, the acknowledgment did not always coincide with the refutation of Aristotle. While Nicole Oresme held that God could create multiple worlds in a void if he so pleased, he “concurred with Aristotle that there is only one world which contains all the matter in existence.” Referring to proposition forty-nine, Thomas Bradwardine writes, “…by means of His absolute power God could make a void anywhere He wishes inside or outside of the world.” At best, such statements appear to be little more than mere concessions rather than wholehearted endorsements.

John Buridan perhaps comes closest to seriously challenging an Aristotelian view. Proposition one hundred ten reads: “That the celestial motions occur because of an intellective soul; but an intellective soul or intellect cannot be produced except by means of a body.” In response, Buridan concludes:

…Someone might imagine that it would not be necessary to posit intelligences to move the heavenly bodies, because Scripture does not say anywhere that they ought to be posited. For it could be said that when God created the celestial spheres, He began to move each one of them as He wished. And they are still moved by the impetus He gave them, because this impetus is neither corrupted nor diminished, since it has no resistance.

However, there is no clear evidence that Buridan rejected Aristotle’s theory of motion in the heavens. In fact, Dales points out that Buridan “seems to accept Aristotle’s doctrines of heavenly movement without any qualification.” And so, given significant evidence found in the primary sources of the time, it is difficult to conclude that the condemned propositions were responsible for the birth of modern science.

Further, university masters were adamant about preserving their teaching freedoms. The acceptance of theological limits did not come without debate and protest, nor were they always followed. Albertus Magnus (ca. 1193-1280), bishop of Regensburg, is said to have traveled to Paris in order to defend his views against the condemnation of 1277. Speaking of Henry of Hesse, Dales writes, “For him the condemnation of 1277 might as well never have taken place in spite of the fact that he himself taught in Paris.” Speaking of Godfrey of Fontaines, Mary M. McLaughlin writes, “Far from moderate in his own opposition to the decree of 1277, Godfrey upheld the right of the theologian not only to seek out, in free discussion, the truth about the articles themselves, but to decide what authority pertained to the

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19 Thijssen, pg. 6 of 8.
20 Proposition thirty-four reads: “That the first cause could not make several worlds.”
24 Dales, pg. 548.
26 Dales, pg. 549.
bishop in these matters.”

William of Ockham staunchly defends his freedom: “Assertions especially concerning natural philosophy, which do not pertain to theology, should not be solemnly condemned or forbidden by anyone...everyone should be free to say freely whatever he pleases.”

Even when the limits were accepted and supported, the relevant issues were nonetheless often discussed. In fact, “Since the beginning of universities, propositions that sounded heretical had been viewed as perfect training tools to test the dialectical skills of young theologians to find an orthodox truth beneath a seemingly false or heretical statement.”

Instead of abandoning or ignoring Aristotelian views, the views were frequently assimilated. Though the list of condemned propositions may seem like censorship to the modern mind, this was not necessarily the view of the time. Lindberg points this out by writing, “In fact, medieval natural philosophers had remarkable freedom of thought and expression...All medieval scholars knew that there were theological limits, and knew approximately where they were, but these undoubtedly seemed broad and reasonable rather than narrow and restrictive.”

If anything, it seems as though the condemnations merely clarified the status quo for those that bothered to listen.

Though we find indirect references to the list of 219 propositions in the writings of Oresme, Bradwardine and Buridan, among others, they cannot simply be construed as church inspired progress. In fact, there is little evidence of any progress over the Aristotelian world-view. In spite of the so-called “intellectual climate” sparked by 1277, even Grant concedes “By the midthirteenth century...Aristotle’s cosmology was solidly entrenched in the medieval universities, where it remained virtually unchallenged until the sixteenth century.”

It was not until Tycho Brahe’s observation of a super-nova in 1572 and of a comet in 1577 that the incorruptibility of the heavens could finally be put to rest, and it was not until Galileo that Aristotle’s system was fully refuted.

However, even in Galileo’s Dialogue Concerning the Two Chief World Systems, written approximately 350 years after the condemnation, the church’s influence remains evident. Galileo’s mouthpiece, Salviati, says, “I did not say, nor dare I, that it was impossible for nature or for God to confer immediately that velocity which you speak of.”

Though this seems to be a concession to the pope, it is obvious that Galileo’s rejection of Aristotelianism was not based on theological grounds but rather, on rigorous argumentation. In fact, later in the text, Galileo demonstrates that the omnipotence of God could be used to argue in favor of an anti-Copernican view. This time the speaker is Simplico, the simple-minded defender of Aristotle: “But with respect to the power of the Mover, which is infinite, it is just as easy to move the universe as the earth, or for that matter a straw. And when the power is infinite, why

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27 McLaughlin, Mary M. “Paris Masters of the Thirteenth and Fourteenth Centuries and Ideas of Intellectual Freedom” Church History Vol. 24, No. 3 (Sep., 1955), pg. 203.
29 Courtenay, pg. 181.
30 Lindberg pg. 76
should not a greater part of it be exercised rather than a small?" That is, God could just as easily move the sphere of fixed stars around the earth as He could move the earth itself.

There are several obvious objections to this line of reasoning in defense of Duhem. First, one may object to the notion that one ought to reasonably expect significant progress because of the condemnation. After all, the concepts that would ultimately overthrow Aristotle were often not evident in everyday experience. It is perhaps unreasonable to expect radical progress in a short period of time and without advances in technology such as the telescope. Further, there is evidence that the effects of the condemnation were indeed widespread. There are dozens of references in the writings of major figures from Buridan to Oresme (which ought to be proof enough), and there is evidence that their effects were felt as far away as Oxford (and as late as Galileo). Thijssen points out, "The collection of Parisian Articles must have had some kind of official status, and must have circulated among medieval scholars. Bachelors in theology were required by oath not to maintain anything in favor of articles that have been condemned at the Roman curia or in Paris." Moreover, Christian apologists such as Stanley Jaki have objected to the warfare thesis. Jaki writes, "The decree of 1277 was a jolt...The jolt was to keep one mentally on one's toes in an anxious awareness of the inconceivably numerous ways in which the Creator could go about his work."

To these objections I cannot hope to offer a thorough and conclusive defense. Short of a book-length manuscript examining each individual case, it is difficult to arrive at absolute truths. Nonetheless, it seems reasonable to derive at least one generalization from the evidence at hand: the effects of 1277 are often exaggerated, particularly by Duhem. And thus, the conclusion of section one may appear to be a weak one: that it cannot be justifiably held that 1277 marks the birth of modern science. This though, I believe to be sufficient for our purposes. And other scholars would support the claim. Though using a different line of reasoning, Alexandre Koyre, for one, completely rejects Duhem's claim, instead arguing that Galileo marks the birth of modern science. This, however, does little more than to pit one authority against another. Arguments holding that the effects of 1277 were in fact widespread must be addressed.

If, as alluded to earlier, one ought not to reasonably expect significant progress as a result of the condemnation, then 1277 becomes an arbitrary date and should not be considered the birth of modern science. Given such criterion, the works of Copernicus and Galileo were certainly more revolutionary and could thus more aptly be labeled as the birth of modern science. Additionally, that the Parisian Articles carried some sort of official status ought not to come as a surprise nor carry any weight. The authority of the church is not questioned here or by any credible scholar. Rather, the issue is whether or not major figures such as Buridan and Oresme seriously considered the decrees in their works and whether or not their works were in turn taken seriously by later scholars. Can it reasonably be concluded that the collection of such works constituted the birth of a new science? Finally, that the effects of 1277 were also felt in Oxford hardly constitutes a widespread influence. The list of English scholars who referenced 1277

33 Ibid, pg. 142.
34 Thijssen, pg. 2 of 8.
36 To complicate matters, there is significant scholarly debate surrounding the continuity thesis. While such arguments may be relevant, I do not intend to discuss them at present.
in their writings (directly or indirectly) is virtually nonexistent. While Paris, Rome, and Oxford would certainly be listed amongst the major cities and universities of the time, the list is hardly inclusive.

II. Grant and Dales Refuted

Without directly disputing or endorsing Duhem’s thesis, Edward Grant presents his own thesis:

It is no exaggeration to say that the medieval Scholastics who accepted and argued for the reality of an imaginary infinite void space beyond the finite and spherical Aristotelian cosmos did so on purely theological grounds.38

Though Grant’s position is clearly weaker than Duhem’s, and can thus more plausibly be defended, it is has consequently lost the punch that Duhem’s thesis carries. In fact, Grant’s thesis is comparatively innocuous. But, it is widespread amongst contemporary scholars. Dales writes:

The most important result of the 1277 condemnations was the creation of an intellectual climate where all sorts of imaginative hypotheses could be suggested and discussed, even if not adopted.39

Dales’s thesis revolves specifically around the condemned propositions concerning the animation of the heavens. Aristotle held that the heavenly bodies moved by way of some sort of “intelligence” or “soul” rather than by a God given force or under their own mechanistic impetus. In support of his claim that the condemnation sparked an intellectual climate, Dales points to examples of innovate thought in the fourteenth century concerning the question of why the skies move. And again, as promised, there is ample evidence of such thought in the primary sources. Buridan, Oresme and Henry of Hesse, among others, all offer very anti-Aristotelian alternatives. Though it is clear that none are purely mechanistic in a Newtonian sense, it would be unfair to expect such radical progression that quickly. There is, nonetheless, evident progress.

However, to conclude that such progress was solely the result of 1277 is not entirely accurate, and Dales is certainly aware of this. In 1271, Robert Kilwardby “vigorously asserted the view of the self-sufficiency of nature…and denied that God moved the heavens…or that either angels or intelligences move the heavenly spheres.”40 Thus, there is at least one instance of a pre-1277 shift away from Aristotelian thought and towards a more mechanistic explanation of why the heavens moved as they did.

Grant uses reasoning similar to Dales in support of his own thesis. He points to Oresme’s Questions on De caelo, Book I, Question 19, in which Oresme concludes that “…outside the heaven there may be a vacuum because God can create a body or a place there.” However, as was argued in section one, it is unclear that Oresme’s remarks amount to anything more than mere musings. And like Dales, Grant is hesitant in his assertion, writing: “In the absence of direct and obvious evidence, my response must be tentative and suggestive.”41 Later in the text, hidden away in a footnote, Grant makes a telling concession: “Thus even if prior to the Condemnations of 1277 views similar to Bradwardine’s had been enunciated, it is nevertheless obvious that article 49 [of the condemnation] played a role in justifying the

38 Grant, Edward. “Medieval and Seventeenth-Century Conceptions of an Infinite Void Space beyond the Cosmos” Pg 59.
39 Dales, pg. 547.
40 Dales, pg. 544.
41 Grant, “Medieval and Seventeenth-Century Conceptions of an Infinite Void Space beyond the Cosmos” pg. 50.
acceptance of an infinite extramundane void by Bradwardine and Oresme.”

This weakens the thesis even further. Post-1277 scholars offered nothing significantly new over pre-1277 concepts and scholarly debates. Accordingly, the role of 1277 is reduced to securing acceptance of old ideas rather than sparking new ideas. This hardly seems like a thesis worth supporting. The important question, however, is if post-1277 scholars were basing their ideas on pre-1277 scholars. Were Bradwardine and Oresme aware of works prior to 1277 that had posited similar views? Either way, it seems that their existence goes a long way in weakening the strength of the claim.

Emulating the method of section one, what would one expect to find if the condemnation did indeed lead to an “intellectual climate?” Obviously, we would expect to find evidence of debate and discussion concerning the propositions. And as promised, this is just what we find (though there is reason to think that this was done in jest). However, what would one not expect to find in an intellectual atmosphere? Surely, one would not expect to find limitations placed on thought or exiled scholars. And yet, this is also exactly what we find. The point here is to suggest that true and meaningful progress can not occur under tenuous circumstances. Otherwise, one may question the motivation behind any relevant progress. Scholars in fear of losing their jobs, or worse yet their lives, are apt to come to any conclusion necessary in order to preserve their livelihood. Under such circumstances, an intellectual atmosphere certainly takes on negative connotations.

While the fight for intellectual freedom against the condemnations of the thirteenth century was a valiant one, it was not without cost. Careers were ruined. Scholars were imprisoned, and in at least one case, burned. Courtenay writes, “When severe punishment was administered, as in the case of the Amaurians in 1210, it was the clerics who were imprisoned or burned outside a gate of Paris, including one master of arts, William of Poitiers.”

In the wake of 1277, Giles of Rome was exiled from the theology faculty from 1278 to 1285. Certainly Duhem would be hard pressed to construe such acts as “liberating,” and it seems that Grant and Dales must accept the negative effects along with any positive effects that may have resulted from 1277.

Further, what sort of intellectual atmosphere can come about in the face of the fear of persecution? Wippel writes, “…the condemnation weighed heavily on the scientific life of the university for some decades…The threat of excommunication was taken seriously, it would seem, and had grave consequences for a master at Paris…a spirit of suspicion toward ‘philosophers’ began to replace, after that date [1277], the spirit of friendly and confident collaboration with philosophy which had generally prevailed…”

And so, perhaps another generalization is appropriate: the condemnation of 1277 could not have sparked a genuine scholastic culture.

Moreover, if an intellectual atmosphere did indeed exist, can it be said that 1277 was responsible for sparking such an atmosphere? The thirteenth century was marked by the translation and absorption of non-Christian philosophical and scientific works. Most importantly, this included the works of Aristotle, ultimately leading to the condemnation of 1277. But, in light of the introduction of the rich intellectual heritage of Greek and Arabic thought, would the decades proceeding 1277 not be considered an intellectual climate? Further, criticism of Aristotle was already commonplace in Greek and Arabic

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42 Ibid, pg. 51.
43 Courtenay, pg. 174.
44 Wippel, pg. 200.
literature. However, it was not until the late fifteenth and sixteenth centuries that the works of John Philoponus and other Greek authors were introduced in Western Europe. The translation of Plato, the Atomists and the Stoics offered additional alternatives to Aristotle. In fact, Philoponus refutes Aristotle’s argument for the impossibility of a void in his “Commentary on Aristotle’s Physics.” Aristotle thought that if there were a void any motion that occurred within it would be infinite, and that he thought to be absurd. By way of reason, however, Philoponus concludes that “…it is possible for motion to take place through a void in finite time…” Had the translation and absorption of Greek and Arabic works progressed without accusations of heresy and the excommunication of scholars, then it seems reasonable to conclude that additional alternatives to Aristotelianism would have been at hand much earlier. Further, such objections came out of real philosophical concerns, not theological prompting.

While Grant and Dales offer evidence in support of their respective claims, there is certainly sufficient reason to doubt their strength. In fact, both Grant and Dales seem less than adamant in endorsing their own theses. Further, to claim that the condemnation sparked an intellectual climate seems absurd given the looming possibility of excommunication. Rather than leading to an intellectual climate, it seems more reasonable to conclude that Oresme, Buridan, et alia, worked to assimilate philosophy and theology. As Lindberg points out, “They were so successful in achieving their goal that by the sixteenth century Aristotle had taken on the appearance of a Christian saint.” The conclusion of section two may again appear to be weak. However, if there is reason to doubt that 1277 created an intellectual atmosphere, then this is adequate for our purposes.

But if, at the least, doubt has successfully been cast on theses A and B, then it has seemingly come at the cost of endorsing a third thesis. Scholars in the seventeenth, eighteenth and nineteenth centuries from, Francis Bacon to Voltaire to Condorcet, routinely criticized the church for the “dismal state of medieval science.” A.D. White, has been so bold as to claim:

…The establishment of Christianity, beginning a new evolution of theology, arrested the normal development of the physical sciences for over fifteen hundred years.

Though White is not widely considered to be a reliable source, Russell has reasserted the “warfare” thesis, and Lindberg holds that “…it appears to me that outside of conservative Christian circles the warfare thesis is overwhelmingly dominant.” Indeed, White is far from alone. Condorcet writes, “The triumph of Christianity was the signal for the complete decadence of philosophy and the sciences.”

However, the arguments presented in section one are still relevant, and they conflict with C. If the effects of 1277 were not widespread and were often ignored, it becomes difficult to place blame on the

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46 Grant, Edward. “Were there Significant Differences between Medieval and Early Modern Scholastic Natural Philosophy? The Case for Cosmology” Pg. 13.
47 The Stoics held that there was a vacuum outside of our finite cosmos, though they were in agreement with Aristotle in that the cosmos itself, as a sphere, was a plenum.
49 Lindberg, pg. 77.
50 Lindberg, pg. 67.
52 Lindberg, pg. 68.
church. Though Aristotelianism remained entrenched until the works of Copernicus, to declare the state of medieval science “dismal” in light of the works of Buridan, Oresme, et alia is nothing short of historical negligence. Indeed, it is easy to exaggerate both the positive and negative effects of 1277.

Lindberg presents a devastating argument to the warfare thesis: “If, instead, we compare the support given to the study of nature by the medieval church with the support available from any other contemporary social institution, it will become apparent that the church was the major patron of scientific learning…Remove the church from the picture, and there is an enormous amount of serious intellectual activity that would not have occurred.”\(^{54}\) While one may demand that science be autonomous, this has rarely, if ever, been the case. In our own culture, political, religious and economic objectives constantly interfere with and impede scientific progress. If the church was indeed a prominent supporter of scientific thought, then the assimilation of theological tenets is a small price to pay, even if the consequences of failing to conform were harsh by today’s standards.

**III. Final Thoughts**

And so, if we can reasonably reject A, B, and C, then what are we to conclude? One author puts the dilemma as follows:

Some commentators, however, see the condemnation of 1277 as only a minor outbreak of hostilities which in the end produced harmony rather than discord, especially given that the condemnation held only for a few decades at the University of Paris, while at Oxford less restrictive measures operated, and elsewhere none at all. Still other investigators go further and argue that by freeing medieval thinkers from the yoke of strict obedience to Aristotle, the condemnation of 1277, in effect, liberated them to conceive new alternatives in solving long-standing problems in Aristotelian science and natural philosophy.\(^{55}\)

While I hope to have provided sound arguments in support of the former and against the latter, I want to refrain from making broad, sweeping generalizations. Lindberg concludes by wisely refusing to pass judgment, either negative or positive, on the church. Where would science be if there had not been a church? If there had been no condemnation? These are what if questions, and as such they cannot be conclusively answered. Science does not occur within a vacuum. To separate competing religious agendas from the progression and freedom of scientific thought is impossible. However, when the available evidence is weighed, it is possible to determine the validity of competing theses. It is possible to conclude that theses A, B, and C each fail to account for a significant portion of the available evidence. Tentatively, I assert the claim that the effects of the condemnation of 1277 were narrow and largely ignored. One may object to the project as a whole as I have outlined it, in that the arguments used to reject one thesis are ignored or misconstrued in promoting another. *Prima facie*, this would appear to be problematic. However, I hold that this is in fact a valid move. The purpose is to undermine each of the three primary stances regarding the condemnation of 1277. If I have been able to cast doubt on each thesis on an individual basis, showing that each faces at least one major problem given the evidence, then shifting positions is certainly fair play.

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\(^{54}\) Lindberg, pg. 74.

References


Party Line:
Allen Ginsberg and political expression in *Death & fame*

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Mention the name Allen Ginsberg and it is hard to resist the urge to drift back into the psychedelic-colored world of the 1960s where free love, drugs and the Beat Poets influenced the literary landscape. Ginsberg came into his own as part of the Beat generation. It was during this time that he helped give voice to the “youthful, dissatisfied, rebellious” energy “that would soon coalesce into the” political “culture and practices of the New Left” (Lee 365). The publication of *Howl*, not only expressed the feelings of a generation but also became, according to literary critics, one of the most influential and important works of the twentieth century. While no one can deny the power of Ginsberg’s work during the ‘60s and ‘70s, his influence on society and politics did not end there. Ginsberg continued teaching, writing and publishing up until his death on April 5, 1997.

Critics and scholars of Ginsberg have largely ignored these later works, and his ability to write the political poetically. *Death & fame*, his last book of poetry, published after his death, offers valuable insights into Ginsberg’s ability to address political topics in a way that melds his ideological beliefs with the poetic and transforms them into something that informs and enlightens. Ginsberg claimed, “That there is no real distinction between political and unpolitical poetry, and I would advise a poet to avoid politics and get to what is his or her most deeply felt perception or impulse” (Rothschild). However, a close reading of five poems from this book, “Peace in Bosnia-Herzegovina,” “God,” “New Stanzas for Amazing Grace,” “Homeless Compleynt,” and “C’mon Pigs of Western Civilization Eat More Grease” will illustrate that despite Ginsberg’s objections to the contrary, much of his later work falls squarely in the political ring, and that he was a master of the genre.

Despite Ginsberg’s claim that he doesn’t “believe in so-called political poetry” (Brown) *Death & fame*, a collection of poems written between 1993 and 1997, addresses themes that include sympathy for the working class, the corrupt nature of political leaders, a critique of consumerism and the necessity for social justice (Lee 379). These themes are not new and have been addressed by Ginsberg in many other works; however, they are given new life by the likes of Newt Gingrich, Jesse Helms, Ronald Reagan and the “party of the Elephant” who embody all that Ginsberg dislikes and become targets for ridicule. This should by no means be read as an endorsement of any political party. Ginsberg’s political views did not fit easily or neatly into any predefined categories.

While his feet and heart were planted firmly in the left of the political spectrum, any politician or political group that failed to address the concerns of the masses received his scorn, including those who may have been otherwise sympathetic to Ginsberg’s causes. For example, he criticizes the left for adopting right-wing tactics and failing to address the rise of fundamentalism, saying that, “The left fumbled the ball by allowing the right-wing style of close-minded aggression to be part of their policy. It’s a fuck up.” Ginsberg goes on to criticize the leadership of both sides for merely engaging in anger
politics, failing to lead and causing the masses to be left “wondering why no permanent change has 
occurred” (Brown). Ginsberg addresses many of these issues in “Peace in Bosnia-Herzegovina”.

This poem is an excellent example of Ginsberg’s ability to craft political poetry. The poem is 
effective in part because of its rhetorical nature. Rhetoric can be defined as “the art of persuasion, the use 
or demonstration of verbal eloquence” (Austin-Smith). The poem is effective as both a literary work and a 
political statement for a number of reasons. As a poem, one of the main reasons it is so effective is its use 
of strong imagery. Ginsberg takes us down the streets to view the devastation inflicted upon the Muslim 
population. We see the “corpses [stinking] in wet fields”, the fires smoldering in back alleys, the broken 
doors of the cinema, the windowless school and the brokenwalled hut (4-5). Each of these images helps 
to convey to the reader not only the hopelessness of Bosnia-Herzegovina but also the horror of the civil 
war. The repetition of the question “Who owns” each of the various buildings named in the poem helps 
Ginsberg to create a sense of rhythm that moves the reader through the poem. Finally, Ginsberg alludes to 
various peacemakers of the past and present, as if invoking their memory will bring an end to the fighting 
and all sides will come to understand each other.

Even this act though expresses a certain amount of futility in the situation. As each is named, they 
are given military ranks or political titles. Mother Teresa becomes “General Mother Teresa,” the Dalai 
Lama becomes “Emperor Dalai Lama XIV,” and Pope John Paul II, becomes an army chaplain (1-4). The 
act of renaming and assigning titles to these individuals belies the complex and troubled history of the 
Baltic region and the ethnic strife that plagues it and questions whether the involvement of any of these 
individuals or the peacemakers from the United Nations will be enough to end the bloodshed. Indeed, the 
repetition of the question who owns the houses, stores, land, etc. hints at the heart of the matter. Ginsberg 
is implying that it is this question, the question of ownership and the economic opportunities that come 
with it, that will need to be settled if there is to be peace. The fact that there is no answer given in the 
poem indicates that this approach to the problem is at best a short term solution and will not provide long-
term peace or stability for the area, or address the ethnic and religious strife hinted at in the poem through 
his reference to Moslem Bosnians.

This poem also fits Ginsberg’s idea of what poetry should do. He believed a poet should write 
“his mind. And like everybody else, his mind is concerned with sex, dope, and everyday living, politics 
included” (Rothschild). By doing this, the poet, according to Ginsberg, would express a reality far more 
real then that given by the media. He believed that “private experience is different from the way it’s 
recorded in the newspapers and on television. We have our own worlds, and then there is the pseudo-
event of newspapers. As Pound says, ‘Poetry is news that stays news,’ which is our actual emotions, our 
feelings [and] thoughts” (Rothschild). The poem represents just such an experience.

The events in Bosnia were ones that spurred a lot of political debate in 1993, the year “Peace in 
Bosnia-Herzegovina” was written. President Clinton decided to send US troops into the Balkans as part of 
the UN peacekeepers in order to halt the genocide and ethnic cleansing that was occurring in the country. 
The Republican Party derided this decision as ill advised and ill conceived. Republicans claimed it would 
bog the US down in a foreign land, for an indeterminate amount of time with no clear exit strategy or way 
to measure victory. The plan, they claimed, was so poorly designed that only a President with no military 
service could have conceived it. Ginsberg’s description of the atrocities that were being committed in 
“Peace in Bosnia-Herzegovina” gives the event immediacy and life that extends beyond a news cycle, a 
politician’s will to act or public interest.
Ginsberg continues writing his mind and what it is concerned with in the poem “God”. In doing so, he expresses his ideas on not only a political issue, but also one that has been of personal concern and interest to him. “God” represents Ginsberg’s own intellectual interest and curiosity in religion. He had spent much of his life trying to establish his own spiritual identity, a journey that took Ginsberg from a Jewish childhood to being a Buddhist as an adult.

“God” opens with the line “The 18 year old marine ‘made his Peace with God’” (14) and then proceeds with the poet asking what that means and which religious text are is going to used to define who or what God is. The poem then proceeds to make a number of historical and literary allusions. Ginsberg refers to the Christian version of Jesus Christ, the Muslim Allah, the Hebrew Jahweh, the Greek and Roman Gods and Goddesses, Buddha, Confucius and other deities from around the world (14). The implicit question being asked of the reader is, which God did the marine make his peace with, and what, or does, selecting one over the other really mean?

Ginsberg alludes to a number of other political events in his questioning as well. He references the first Gulf War with the marine, the sentencing of Salman Rushdie to death for writing the novel Satanic Verses by the Ayatollah Khomeini, Billy Graham ministering to a disgraced Richard Nixon, and the televangelists that filled the airwaves asking for donations from their virtual flock. The use of free verse and prose language helps add to the stream-of-consciousness feeling the poem gives the reader. This choice by the poet helps the reader to experience certain feelings, the effect the poet wants is a sense of uncertainty and confusion about what seemed a straightforward statement in “made Peace with God” (14). In this poem, Ginsberg effectively comments not only on the xenophobic world view that most Americans have especially about the nonwestern world, but it also calls into question politicians, policy makers and reporters who play on our ignorance and use this seemingly simplistic quote as a tool to justify the actions of the United States by implying that “God must be on our side.” Ginsberg wants the reader to question this statement because it has become a “familiar message of mass culture that lend[s itself] all too easily to political propaganda” (Johnston 105-06).

Another poem that continues along this same path and also represents Ginsberg’s own intellectual interest and curiosity about spirituality and religion is “New Stanzas for Amazing Grace.” Using the popular gospel song as a model, Ginsberg rewrites the lyrics to reflect a modern political issue, that despite media attention has not garnered the political attention, or solution that Ginsberg believes it should have received. This conclusion is supported by Ginsberg’s repeated use of homelessness as a theme in several of his poems written during this time period. Similar to his other work, Ginsberg uses a number of poetic and rhetorical devices to make the poem effective as both a political statement and poem. One literary device that is effective is the poem’s use of the first person “I.” This choice draws the reader into the dream of the narrator as an active participant, where he imagines what it must feel like to be homeless and, as a result, invisible to the common man. “I dreamed I dwelled in a homeless place / Where I was lost alone / Folk looked through me into space / and passed with eyes of stone” (Ginsberg 1-4, 17-21). This idea is reinforced by the repetition of this stanza at the end of the poem as well as at the beginning.

The poem also employs imagery that reinforces the reaction of the masses, in this case the narrator and the reader, to the homeless in their reluctance to see and engage with them in a meaningful way. For example, in the third stanza, Ginsberg again uses the image of the eye and its inability to see the less fortunate among us. “Woe workingman who hears the cry / And cannot spare a dime / Nor look into a
homeless eye / Afraid to give the time” (9-12). In this section, Ginsberg both passes judgment upon those who fail to acknowledge and lend assistance to those less fortunate. Similarly, in the fourth stanza Ginsberg extends this condemnation and offers a blessing to those people unfortunate enough to encounter these ungiving souls. “So rich or poor no gold to talk / A smile on your face / The homeless ones where you may walk / Receive amazing grace” (13-16).

This poem works as a political statement as well because of its rhetorical nature. Ginsberg is effective in articulating his convictions and persuading the reader of their validity through his invocation of the spiritual message of the hymn. In the standard lyrics, the singer thanks God for his grace that has returned the singer’s sight and allowed them to see the glory around them. As in earlier works, “New Stanzas for Amazing Grace” expresses Ginsberg’s “desire for spiritual realization and a sense [that we are as a society are] entrap(ed) in a world dominated by a consumerist ethos” (Johnston 116). By invoking this allusion, Ginsberg makes his political statement clear, but in a way that avoids catch phrases, buzzwords and the talking points of modern political commentary. In addition, the allusion helps give the poem added spiritual and moral weight that makes his call to action more compelling in stanza two “O homeless hand on many street / Accept this change from me / A friendly smile or word is sweet / as fearless charity” (18).

“Homeless Compleynt,” a poem that was written two years after “New Stanzas”, mines a similar vein both in subject matter and in sentiment. While it again “breaks the covenant of artistic discretion and delicacy by demanding that we think about the unpleasant” (Austin-Smith). Like “New Stanzas”, the narrator is homeless and also a Vietnam veteran, who is trying to engage the reader for help. The poem is free verse and has the narrator addressing the reader directly in a very conversational tone. The reader gets a sense of the narrator as someone who is perhaps ashamed of his past and his situation. This is supported by the first line of both stanzas, in which he apologizes to the reader for interrupting him. In addition, the narrator offers the reader reasons why he is worthy of assistance. He notes that he is “clean” (7, 14), a veteran who is psychologically scarred by the war (2-3), and that he does try to make his own way (17-18) but needs a little assistance to make it that day.

This poem, while it works as a political statement, is less effective than other political poems in the collection. Perhaps it is because it is “too specific in its aims, or too direct in its address, whereas art, so the argument goes, is subtle in method, and universal in appeal” (Austin-Smith). This is not to say the poem is without merit. It does evoke emotion and uses imagery to help convey its message, a message that is readily apparent. However, it lacks the light hand and artistry so readily apparent in “New Stanzas.”

During the 1980s and ‘90s, the government’s disregard of Vietnam veterans had made its way into popular culture. For example, the opening sequence in Eddie Murphy’s film Trading Places where he pretends to be a panhandling homeless vet, the music of Bruce Springsteen (Born in the USA), and news coverage of the issue added to the awareness of the problem of homelessness among former service men and women, an issue that achieved a level of notoriety in the popular media.

In addition, there were numerous news stories, articles and even benefits to aid the homeless, including Hands Across America and Comic Relief all designed to raise money for this issue. The intent of all of these was not only to highlight but also, as with the latter programs, to solve the issue despite cuts by the government in federal programs designed to address this problem. “Homeless Compleynt”
tries to address a political issue that had fallen off the political radar of many when it was written in 1996. In it, Ginsberg puts aside his feelings about Vietnam and embraces those who served and were scarred by the war in order to give voice to these outcasts.

“C’mon Pigs of Western Civilization Eat More Grease” is an excellent example of Ginsberg’s ability in terms of both his ability to write poetry, but also to deliver a sharply honed political message as well. The free verse poem addresses one of the political and sociological issues that concerned Ginsberg throughout much of his life, that of America’s love affair with consumerism. In this poem, Ginsberg takes Americans to task for their over-indulgence at the dinner plate in a way that is humorous and playful, yet leaves no question as to Ginsberg’s thinking on the issue.

It opens with “Eat, Eat more marbled Sirloin more Pork ‘n / gravy! / Lard up the dressing, fry chicken in / boiling oil” (1-4). These lines are highly effective in setting the mood and tone of the poem. Immediately you are drawn to its sense of absurdity and playfulness. Here is a poem that is embracing all of the negative aspects of American food culture, contradicting the countless reports in the media and medical advice and saying “Yes!” to gravy.

The poem continues for several more stanzas invoking images of Pepsi, Coca-Cola, Wimpy's, McDonald’s, etc. stretching to the “moon” and eating it all until “burp!” and we’re done (24). In the first forty-three lines of the poem, there are only five lines that hint at the possible negative side effects of this type of diet. Even these references though are passed off in a playful tone. We are told to “watch out heart attack, pop more / angina pills / order a plate of Bratwurst and fried frankfurters” (20-22). Or “check yr. cholesterol, [and] swallow a pill” as we pack two more doughnuts under our “size 44 belt”, just before we pass out in the vomitorium coughing up strands of pastrami (30-35).

The poem makes excellent use of lists and imagery as it runs the gambit of all things that Americans love to consume and even mocks our obsession with super sizing our servings in the line “a mini big spoonful of salty” rice. The irony in the phrasing of this line is obvious. To describe a spoonful as being mini big indicates that it exceeds the size of normal spoons by a good margin. Yet this spoonful, which most readers would assume they know the size of, is not as large as it could be because it is a mini big spoonful. It is hard not to think of how sizes or portions at restaurants have grown larger and larger over the last several years.

It is not until a space break after line forty-nine that we begin to hear about the down side of a Western diet. Ginsberg weaves in references to the immigrants who fill many restaurant jobs, serve us up the gravy, and lard laden delicacies we crave, all the while, many cling to their healthier vegetarian or low meat diets that prevent many of the medical conditions described as the poem progresses. This however is changing.

This change is the political subject Ginsberg addresses in the poem. He addresses indirectly the culture creep of Western civilization, and in particular American culture. It is hard to escape the fact that the United States has been very successful in not only exporting Levis and movies, but also our appetites for “Western cuisine rich in protein / cancer heart attack hypertension sweat / bloated liver & spleen megally / Diabetes & stroke – monuments to carnivorous / civilizations” all of which are slowly killing the world (50-55).

Ginsberg even chastises Americans for our failure to “set an example for developing nations” (42). Despite this shift in tone, Ginsberg ends on a light note offering us “black forest chocolate cake”
because we deserve it (61-62). It is the sarcastic humor that helps make the poem work and the reader engaged and reading. It is able to balance effectively Ginsberg’s political message with the craft demands of his poetry and continues the tradition begun with *Howl* to offer a “critique of American consumer culture” (Johnston).

In the end, his repeatedly turning to political events as grist for his poetry undermines Ginsberg’s claim that he did not believe in political poetry. Ginsberg came of age in “the early Cold War years [that] were marked by an unprecedented politicization of culture and by the conscription of private life in the name of national security. The key to political containment abroad was, then, personal self-containment at home” (Harris 172). It was this self-censorship and societal pressure to conform that Ginsberg spent his life railing against in thought, action and poetry. Ginsberg had seen firsthand that if people were unable to strike back at their enemies then “the most vigilant patriots [would go] after the scalps of their countrymen instead” in an effort to protect “their” way of life (Whalen-Bridge 618).

Ginsberg responded the only way he knew how, with words. By doing so, he hoped to expose the idea of conformity as corrupt and those promoting it as a “small band of thieves, [from both the] right and left, [that were] taking [it] upon themselves to be dictators and lead everybody astray” (Brown). This act proves Ginsberg loved his country, regardless of what he may have thought of its government (Kauffman). Ginsberg, through the act of writing poetry about those things that filled his mind, wrote about the political decisions that impacted him and in doing so made himself into a political poet despite his feelings to the contrary.
Works Cited


On Public Knowledge

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In “Elusive Knowledge”, Lewis begins by saying that we know a lot of trite information about the ordinary world. I know what carrots are. I know how to drive a car. I know that when someone greets me and holds out their hand, they expect me to shake it and so on. However, when we talk in philosophical terms about knowledge, we have no reason to say that we really know anything. There seem to be two contexts of knowing something. Regarding the everyday, general type of knowledge, I know a lot. But when I put on my philosopher’s hat, it looks like I can’t say I really know very much at all. As a result, it is argued that either we know lots of things, or we must submit to skepticism.

Lewis does not think this is the case, and I agree. I do not think that we need to be skeptics; we can claim that we know a lot of things. In a further blow to skepticism, the things that we do know are usually not isolated. So my argument is that, unlike the skeptic, not only do I know a lot of things, I know a lot about things about the world that I have not checked for myself.

The argument against Cartesian skepticism

In the traditional skeptics’ view, Descartes begins with the individual thinker and no knowledge, and from that view we must first establish that I exist, and that God exists, and that material objects exist, etc. in order to find out about our world. However, Coady argues that people do not actually operate that way. We do not begin with nothing and then establish facts which entail other facts to ascertain whether or not we know something. If we accept deductive closure, then to know $p$ entails knowing all of the entailments of $p$. Thus, if I look at a tree, then it follows that I know what a tree is, that I am not hallucinating, that I am not a brain in a vat on Alpha Centauri, and so on. But I have not personally checked that my eyes are working properly.

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2 This is the philosophical position where, roughly put, we cannot say we really know anything because we cannot attain the required level of certainty for any information we may claim to know.
5 This is a highly contentious point. Deductive closure is where knowledge of $p$ and that $p$ entails $q$. So if I know $p$ and that $p$ entails $q$, then $q$. Nozick and Dretske argued against it, but it is not a major issue here and for the purposes of the paper I will simply accept deductive closure: Nozick, R., Philosophical Explanations, Harvard University Press 1981.
or that I am not in a vat, or that I am not on Alpha Centauri. Further, if I had to find out all these peripheral things (such as proving that my eyes are working), there would be other facts following from the peripheral facts that I would need to also prove (such as the fact that I actually have eyes) and so on. But, luckily, we do not actually operate in that fashion. To know \( p \), I do not have to establish the truth of other propositions \( q, r \) and \( s \) which are entailed by \( p \). So while I have not utterly defeated the Cartesian skeptic, I have at least pointed out that the skeptical view is neither practical nor applicable to ordinary people in ordinary situations.

Similarly, Searle argues that we are equipped with a background which tells us, in a given situation, what information is superfluous, and what we should be paying attention to. This background is made up of our experiences and interactions with the external world. But in that external world are also other people, so receiving information from people must be considered in the same manner as receiving information about trees. When receiving information from another person, the skeptic argues that you must ascertain whether or not that person is reliable, because you can rely only on testimony from established sources. So, according to the skeptic, you must figure out that there is an external world, and that certain things in the world are people, and that they express words, and that some are reliable. Then, based on the words you have heard and your past interactions with this person, you can determine whether or not to believe what they have said. But again, we do not actually function in this way. Instead, given the necessity for social interactions, we generally trust that a person is telling the truth and accept what he or she is saying.

I will discuss the concept of shared knowledge later in this paper. In the meantime, I will examine what it is that we are sharing, before discussing how it is that the information is shared in a social setting.

**The Context and Content of Knowledge**

Lewis claims that when we say that we know something, we mean that we know it within a certain context. The background lets us know what the appropriate context is for a given situation – so that you and I will understand each other and can exchange information. Suppose I am at a bar and observe that “every glass is empty”. “Every” is a universal quantifier, but surely I do not mean that “every glass in the entire world is empty” at the time of my utterance; that would be absurd. Instead, what I mean is that I am narrowing my utterance to meaning “every glass within the context of this bar is empty”. In everyday language, there is an implicit contextual limitation in what we say.

We must distinguish between the context of knowledge and its content. I might know that water boils at 212 degrees Fahrenheit, because this is a type of regularity that I have observed whilst making tea at home. My knowledge about boiling water is limited to the context of

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6 Coady, op cit.
9 Searle, op cit.
ordinary tea making. But were I to try and boil water on the top of Mount Everest, I might find out that, there, water does not boil at 212°F. So after my expedition to Mount Everest, the content my knowledge about the boiling point of water has changed: in all ordinary circumstances, and at normal pressure, water boils at 212°F. But I also know that there are exceptional circumstances at which water does not boil at 212°F.

When a fact’s context and the content are put together, we encounter situations where the content of what we assert remains the same while the context changes. I might say that I know the table is flat, but there is nothing that is completely flat\(^{10}\). So what I mean is that “relatively speaking, and ignoring the microscopic bumps here and there, I know that the table is flat.” However, flatness changes with context. A crease on a cricket pitch may be considered “flat” for the purposes of playing cricket, but that surface is not “flat” for someone who is an ice-skater or plays curling, because, for those sports, the surface of the ground requires a higher degree of flatness than it does for cricket. So while the content of our facts (that is, “this is/is not a flat surface”) remains the same, the context changes depending on other factors (such as its material, intended use, etc.).

**The context of knowledge made public**

When I say to you that “the table is flat”, I am not only expressing my belief that the table is flat, but I am also assuming that we share enough background knowledge so that you have certain basic knowledge about what a table is, and you know what flatness is, and so on. Similarly, you would also be assuming that when I am talking about a table being flat, what I am talking about conforms to what you know about tables and what you know about flatness.

There is a lot of knowledge that is shared in the public domain, or by at least two individuals. Searle’s argument for collective intentionality is relevant, and I will adopt it as follows\(^ {11}\). Given our social environment, there is a large set of knowledge that is shared, or at least tacitly assumed for us to be able to interact with each other and function socially\(^ {12}\). We make these assumptions about shared knowledge regularly. The rules of multi-player games, road laws, etiquette, etc. all rely on the presence of a common knowledge among its participants. Wittgenstein’s argument for “language-games” also reflects this view in that language exists fundamentally for the purposes of human activity and as such language is possible only when people share a “form of life”, such as those discussed in this section\(^ {13}\).

So there is a large pool of knowledge which we assume is shared in order for everybody to be able to interact and work together in a society (such as everyone driving on the same side

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\(^{10}\) This example is attributed to Lewis, op cit., pp 425-426. See also Unger, P., *Ignorance*, Clarendon Press 1975, especially chapter II.


\(^{12}\) For example, we assume that two musicians playing a duet would know what each other was doing in order for them to play together in that they share knowledge about how to play their instruments, how to read music, etc.

\(^{13}\) Wittgenstein, L., *Philosophical Investigations*, 1953, II.
of the street, etc.). In fact, a lot of the things we do are based on *convention* – that is, we roughly have a convention when:

1) everyone conforms to a regularity $R$;
2) everyone expects everyone else to conform to $R$;
3) everyone prefers to conform to $R$ on condition that the others do, since situation $S$ is a coordination problem and uniform conformity to $R$ is coordination equilibrium in $S$.

Many of our conventions are tacit – nobody has discussed the social norms of what we do but what we actually do is founded on a set of mutual expectations. I expect that, in a certain situation, you expect me to act in a certain way, and so I act in that way because that is what I expect you to expect from me. In other words, in a case of independent decision between rational people, if I am figuring out what you will do, I am trying to replicate your practical reasoning. In order to do this, I need to figure out what you expect me to do, and this means that you would be replicating my reasoning. So, to replicate your reasoning, I need to replicate your *attempt* to replicate my reasoning. In this way, a mutual expectation arises, since we each expect the other to behave in a certain way. For example, suppose you and I have arranged to meet at a particular time in a foreign city, but we have not specified a particular location in that city. In order for us to meet, I must figure out where you are expecting that I will expect to meet, and go there. Perhaps there is a large bridge in the middle of the city; if I think that you would think that I would consider a noticeable bridge to be a good place to meet, and if you also think that I think that you would choose such a place, then we will be able to meet at the bridge.

**The causes of shared knowledge**

Further, a social environment such as ours is constantly being saturated by information. Labels on food, street signs, the news on television, covers of books etc. are bearers of information which we can obtain as knowledge. For example, as I walk up the street, there is information that I have come know, because I can see and read it. So I know that today, gas is at a certain price. I know that there is a special book offer with today’s newspaper. I know that you can park here only if you have a particular permit. I know that there is a crossing, and if you want to cross the road you push a button. And so on. Any other person who can see and read can also obtain this information.

But *how* is this information shared? I submit that knowledge, or at least knowledge of this kind, is causally obtained. As I walk up the street, I am bombarded with information about gas prices, parking zones, book offers and so on. I am not given any justification for this information,
but I assume that there is some sort of underlying cause for the information I see. If there were no books, then there would be no book offer. So the fact that there is a book offer is causally dependent on the existence of books, and the sale of the books is causally dependent on people’s knowledge of the book offer. But I personally have not checked if there are books or not; it is an assumption I make based on the common knowledge that generally, when people say that they are offering books, they really are offering books.

But, regardless of whether or not I know the originating cause of a piece of information in the public domain, I can say that there is some sort of cause of my acquisition of that piece of information. Suppose that you know that ravens are black, but I have never seen a raven before. You tell me that ravens are black and are of a particular size. You show me lots of empirical data about ravens from ornithologists and photographs of black birds. On the basic requirements of knowledge, I now have some sort of true, justified belief about the blackness of ravens, even though I have never seen a raven before. And if I were to see a black bird of such a size and shape, with a particular set of behavior patterns and so on, then I would say “That bird is a raven”, then I am saying that “I know the bird fits the description of a raven”, and chances are that I would be right. So I can say that I do know that ravens are black. But what is more is that my knowledge of the blackness of ravens is counterfactually dependent on your knowledge. And so knowledge is passed on in this fashion.

This is true of many things. I can assert that I know that Napoleon was the emperor of France, although Napoleon is now dead and I have never met him, and nobody alive that I know has ever met him. I can also say that I know that Mount Everest is the tallest mountain in the world, even though I have never been to Mount Everest or measured the height of any mountains generally. But there are people who have been to Mount Everest and other mountains, and have said that there is no mountain taller than Everest. If I believe their testimony, I can say that I know that Mount Everest is the tallest mountain in the world.

Likewise, the content of what we know depends on the causal history of that particular piece of information. We can have reliable knowledge even without justifications. However, in order for the knowledge to stay within the public sphere, it must be reaffirmed regularly. The vast majority of us would be inclined to say that we know the earth is round. But what is the justification for that claim? Perhaps I heard it from other people. Even so, if I knew who I heard it from, then what is their justification for the claim? Over time, as our knowledge is shared, our justification for that knowledge becomes weaker. So, every now and then, we have to rejustify and reinforce our knowledge.

For example, I may already know that the earth is round from other people’s testimony. But when I am on a boat and I see the land disappear over the horizon, I might figure that the reason I cannot see the land anymore is due to the curvature of the earth. And eureka! I realize that I know the earth is round. But it is absurd to think that I did not know this before. I did know it, but the very fact that I have seen the effects of the earth being round for myself indicates that

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18 I am aware that there is much debate about whether knowledge is really justified true belief but this is not the issue I am looking at here: Gettier, E., “Is Knowledge justified, true, belief?” *Analysis* 23 (1963).
my knowledge has been confirmed. And so my link in the causal chain of knowledge about the earth’s roundness is strengthened, and any of the subsequent links after mine are also stronger.

**Expert testimony: the pyramid and lattice structures**

So, sharing knowledge is a process of dividing epistemic labor\textsuperscript{19}. We have experts in different fields who obtain (or reconfirm) facts and pass them into the public domain. But it is not that simple. The experts we rely on are also relying on other experts! Scientists are permitted to assume such things such as 212\degree F being the boiling point of water and so on; they do not have to go and empirically test this out every time to justify their experiments, so scientists base their findings on presumptions established by other scientists, and those scientists on other scientists, and eventually if we dig down enough through the levels of knowledge we will end up with an originating cause of a piece of publicly known information and there would be many levels of knowledge, like a pyramid.

However, public knowledge does not have a unilateral direction of fit. It is very rare for an expert (or anyone else) to rely on sources without proffering some reciprocating information. I might go to a doctor because I am unwell, and the doctor has knowledge as to my symptoms and how to alleviate them. But although the doctor has more medical knowledge than I do, a doctor cannot assess my symptoms and suggest a remedy without relying on my at least describing how I am feeling. A doctor relies on testimony from his or her patient in order to know what ailment the patient is suffering from. I am relying on my doctor to tell me about my symptoms, but in order for him (or her) to do so, he or she must first know dip into the pool of public knowledge to ascertain what the symptoms indicate. But I am part of that pool of knowledge, because the doctor relies on what I know about how I feel!

So perhaps the pyramid model for knowledge is not exactly correct. The simplistic pyramid structure has been widely criticized because it does not account for the mutual reinforcement between an explanation and what it explains\textsuperscript{20}. My knowledge fits in with my other beliefs and knowledge, but those other beliefs have been selected because they also fit with my knowledge. A more suitable version is a lattice or web structure, in which we have an interlocking set of shared facts. It is very rare that one would have to rely on the knowledge of someone who has not (at some other point) relied on oneself. Knowledge is pervasive and the mutual expectations we have of each other exist at all levels, between experts and non-experts.

**Causation and the lattice structure**

How does the causal chain fit the lattice structure? I have indicated that causation has a unilateral direction of fit, so how do we obtain mutual support for a causal picture? I think the answer lies in our conventions\textsuperscript{21}. Convention by definition has symmetry to it, based on mutual

\textsuperscript{19} This is analogous to the division of linguistic labor that Putnam refers to in his paper: “Meaning and Reference”, *Journal of Philosophy*, 73 (1970).

\textsuperscript{20} Quine W. V., and Ullian, J., *The Web of Belief* (2\textsuperscript{nd} Ed.), Random House, 1979, p 79.

\textsuperscript{21} See Lewis, *Convention*, ibid.
expectation. Take the previous example of my walking down the street. I suppose there is a cause for the signs that I see. This is one direction that the causation and expectation run in. Now, suppose I own a bookstore, and I want to sell books. A person wanting books goes to a bookstore. A person wanting to sell books wants people who want books to go to their bookstore. So we have established a mutual expectation of selling/being sold books. But where is the causation? One cause of books being sold is advertising. I might put up a sign that says “books for sale”. Assuming others can read and use the same language, whether or not I sell books (and how many) counterfactually depends on what sign I put up (if at all). So human action is more causal than logical, because there may not be any logical reason for selling the books, but there is a causal reason arising out of social convention.

Similarly, in many cases, we are mutually the causes of each other’s knowledge. We are a community of knowers, and it is commonplace for us to learn from each other. Quine suggests that the “totality of our knowledge or beliefs… is a man-made fabric which impinges on experience only along the edges.” This suggests that the causal relation exists at the periphery between knowledge and experience. However, a “thread” is causally related to the other “threads” by virtue of being interwoven, and if a “thread” is changed at the periphery, the change also has an effect on the other threads.

A well-known illustration is the Ship of Neurath. All sides of the boat mutually support other sides and rely on a mutual configuration of the ship. The set of planks in the ship have a relationship between them and the whole set of planks (that is, the ship) is held up by the water. The water as a whole holds up the entire hull of the ship in virtue of the two-way forces between the planks in the hull. Likewise, human knowledge is supported by reality as a whole, not one “plank” at a time. Each item depends on others for support. The interrelated causal structure between the planks is also causally related to the world.

However, within the lattice structure, there are sections which may be more unilateral than others. A kindergarten teacher may be able to impart a lot of knowledge to her students, but not receive much in return. Conversely, a university professor and a class of graduate students may have more balance in knowledge and therefore a more lattice-like information exchange. Nonetheless, the overall structure of our shared knowledge is lattice-like, and such “pyramidal” instances are uncommon.

**Conclusion**

The traditional view of the Cartesian skeptic is mistaken. We do not actually behave in the way that the skeptic supposes, as we have a large pool of shared knowledge. Our social background tells us what the relevant knowledge to draw from the pool is in any given case. We already have a common language between us so the content of our knowledge can be expressed,  

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22 Again, we could use Searle’s term “collective intentionality”.


and it can be understood to be within a particular context. This is due to our social conventions governing language and social behavior.

Our knowledge is shared through the causal history of the facts at hand. We pass knowledge to one another and occasionally reaffirm what we know in the public domain. Expert testimony is particularly relevant as it shows our readiness to rely on facts that we have not empirically proven ourselves. However, there is interdependence in the division of epistemic labor and as such the imparting of knowledge takes place on a lattice-like, and not a pyramidal, structure. In sharing facts we are also commonly mutual causes of each other’s knowledge. And so it is through this combination of mutual dependence and sharing that we arrive at a theory of knowledge which truly reflects the society in which we live.
References


The Study of Ink Pigment Dispersion Parameters

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ABSTRACT

The purpose of this study was to investigate the influence of rotation speed and milling time on the pigment dispersion quality. The information can be used to obtain a standard laboratory condition at which a wide range of pigments may be dispersed to formulate water-based rotogravure inks. The influence of pigment concentration and shear forces on the pigment dispersion were also studied.

The procedure consisted of dispersing the pigment using a laboratory Dispermat® SL bead mill at various milling times with two different rotation speeds and measuring the particle size and particle size distribution of the milled samples. The pigment was then dispersed at standard laboratory condition with different pigment concentrations.

INTRODUCTION

As for the future of printing processes, ecology will play a much larger roll, with special attention being paid to eliminating waste, emissions, and reducing energy input. One main focal point will be the reduction of the volatile organic compounds (VOCs) released into the atmosphere. Water-based inks represent a proven solution to reducing VOC emissions. Water-based inks are cheaper, decrease atmospheric pollution, have less solvent, lower fire risks, less print odor, remove the need for recovery plants; and are easier to wash-up on the press.

The manufacture of printing ink is a technologically advanced highly specialized and complex process. The basic formulation of ink involves the grinding of pigment in a vehicle to form the pigment dispersion, then letting down the pigment dispersion with suitable resins to meet rheological and functional properties. The main components of water-based inks are pigment, binding agent, carrier (water) and additives. Binding agents are acrylic resins, which are emulsions or diluted to water with amines. The proportion balance of these types of binding agents is made to fit the printing process and the quality requirements of the final product. Additives used in water-based inks are antifoam, waxes, extenders, pH-controllers and surfactants. Water-based gravure ink formulation contains pigment 6-17%, binding agents 10-30%, solvents 1-12%, and water 45-66% [1]. The surface tensions of the water-based inks are 30-40 dyne/cm. The primary feature of the drying process in water-based inks is evaporation.

The pigment in most printing inks is the most expensive part of the formulation; economics of pigment selection and proper dispersion are of vital importance [2]. The production of ink depends on basic physical processes involving complete wetting of the pigments and their even distribution in the surrounding vehicle. This complex process is called “Dispersion”, and has to be clearly differentiated from mixing or stirring [3]. The quality of the final dispersion is dependent on the optimization of many influencing factors.
The dispersion of pigments in printing inks is important for several reasons but the effect of dispersion quality on the rheological behavior of the ink is perhaps the most important criterion. Because of the application methods flow properties are all important in inks and this is certainly the first hurdle that a printing ink must satisfy, in order to be considered for potential use [4]. To achieve the optimum benefits of a pigment, it is necessary to obtain as full a reduction as possible to the primary particle size. The color strength of a pigment depends on its exposed surface area, and the smaller the particle the higher the surface area and thus stronger the color [1,7]. Increasing demands on quality printing inks regarding the optical characteristics such as gloss, transparency or color strength require the use of more effective dispersing techniques [2].

There is a wide variety of printing ink media used in the modern printing processes. Variation in the viscosity of the ink vehicle and the methods of incorporating pigments into such vehicles have considerable effects on the shear that can be applied to pigment particles and agglomerates and therefore on the speed and fineness of the ultimate dispersion [4]. The rheological properties are important in the application of inks and associated phenomena such as tack of the ink. This is important in obtaining an even distribution on the press and proper transfer to the paper. This is also controlled to some extent by the dispersion properties of the material.

The Dispersion Process

The dispersion process involves the breakdown of associated particles into smaller particles and their distribution in a fluid, leading to a colloidal suspension. A colloidal suspension is characterized by the behavior that the finely divided particles do not settle under their own gravitational forces. Pigment particles can be divided into three classes: primary particle, crystallites, aggregates, (primary particles having a surface to surface contact) and agglomerates, (primary particles touching each other via edges and corners) [3,5]. The steps involved in pigment dispersion process as follows.

Wetting of the Pigment Particles

The wetting of the pigment particles is influenced by the following factors (a) geometry of the particles, (b) viscosity of the vehicle, (c) surface tension of the vehicle, and (d) chemical character of the solvents. The Washburn equation describes the wetting process [3,6]:

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\frac{\text{\textit{V}}}{\text{\textit{T}}} = \frac{\pi \, \text{\textit{R}}^3 \, \sigma_L \, \cos \delta}{2 \, \text{\textit{l}} \, \eta}
\]

where

- \text{\textit{V}} = \text{transported vehicle volume}
- \text{\textit{T}} = \text{time}
- \text{\textit{R}} = \text{capillary radius}
- \sigma_L = \text{surface tension of the vehicle}
- \eta = \text{viscosity}
- \text{\textit{l}} = \text{length of the capillary}

The equation shows that the speed of the wetting increases with the size of the capillary in the pigment powder and with a lower surface tension of the vehicle. Another important factor for the speed of wetting is the viscosity of the vehicle. The Washburn equation states that the low viscosity provides faster wetting. The chemical nature of the solvent plays an important role in the wetting process. The affinity between pigment and solvent must guarantee a sufficient wetting ability.
Breakdown of the Pigment Particles

The breakdown of pigment particles can be described as follows:

(a) spontaneous breakdown, during the wetting process

The pigment particles are wetted by the vehicle, which causes a more or less spontaneous breakdown of the forces holding the smaller agglomerates together;

(b) mechanical breakdown

The remaining agglomerates have to be broken down by transferring mechanical energy into the system; The transfer of energy is performed with special dispersing equipment [3,5].

Stabilization of the Dispersion

The purpose of the stabilization is to maintain a colloidal system during further processing or storage of the dispersion. The stabilization of the finely dispersed particles avoids reagglomeration and flocculation

OBJECTIVE

The objective of this project was to evaluate the effect of rotation speed, milling time, and pigment concentration on pigment dispersion quality, particle size and particle size distribution using different mixing/milling techniques for water-based gravure inks.

EXPERIMENTAL DESIGN

Materials

Pigment Heuco Blue-15 was used for dispersion supplied by Heucotech limited USA. Joncryl HPD-96 resin solution (34% NV), low VOC colloidal solution, 26 % solids and 1.07 sp. gravity was used as dispersing resin for high solids, gloss, strength and improved shock stability. Surfynol CT-131 grind aid was used as wetting agents to reduce the vehicle surface tension and help the vehicle to penetrate the microscopic air pockets in the pigment agglomerates. DeeFo PI-45 antifoam was used to prevent foam buildup

Dispersing Media- "Dispermat® SL." Bead Mill

A "Dispermat® SL" bead mill consists of a milling system and separate instrument control case. The milling system exists as a double wall grinding chamber and a motor for the agitator in the chamber. The essential dispersion parameters can be optimally and independently controlled via the control case. Product feeding can be done by air pressure and the dispersion process is completed in several passes. The actual particle size reduction in the grinding chamber of a mill is accomplished by the moving grinding material, which is activated by a high speed and high-energy agitator. There are two types of particle size reductions (a) shear and (b) collision / impact, as the grinding material collides and rolls about each other, the solid particles get caught between them and are gradually reduced in size.

The quality of the dispersion degree is dependent on the following characteristics:

(1) pigment volume concentration, pigment to vehicle ratio,
(2) type, size and density of the grinding media,
(3) residence, or dwell, time,
(4) milling time or cycle,
(5) rotation speed,
(6) energy input, and
(7) temperature [3,5].

The selection of the grinding media depends upon the nature of the pigment, viscosity, desired particle size of the finished product, color and appearance requirements (gloss, haze, color strength, transparency). The residence time or dwell time is the time required for the product to pass through the mill. If the dwell time is too short, the mill base will not be sufficiently dispersed and if the dwell time is too long the material can be over dispersed resulting in decreasing gloss and increasing haze. The dwell time can be controlled by the amount of applied air pressure. The rotation speed should be independently adjustable from the throughput rate. The dispersion degree depends on the amount of energy input i.e. the highest possible agitator speed and the residence time in the chamber. The agitator speed of the Dispermat SL is variable between 0-6000 rpm. For optimum dispersion results, the temperature of the mill base has to be controlled. The Dispermat® SL is equipped with a double wall for circulation of cooling water through it.

**Particle Size Analyzer- NICOMP 370 DLS**

DLS (dynamic light scattering) also called QELS (quasi-elastic light scattering) or PCS (photon correlation spectroscopy) was used for analyzing the size distribution of particles suspended in water. Light from a laser is focused into a glass tube containing a dilute suspension of particles [7]. The intensity of light scattered by a single, isolated particle depends on its molecular weight and overall size and shape [8], and also on the difference in refractive indices of the particle and surrounding solvent. Three different types of weighting systems (a) volume-weighted, display the relative particle volume vs. diameter; (b) intensity-weighted, display the relative intensity of scattered light vs. diameter; (c) number-weighted, display the relative number of particles vs. diameter; may be used for the measurement of particle size and particle size distribution.

**Particle Size and Particle Size Distribution (PSD)**

The main objective of the dispersion process is to produce a stable colloidal system in which the pigment particle size distribution ranges between 50 and 500 nm. Color strength, purity, gloss, and opacity achieve maxima in this range [1,3,5,7]. The particle size and particle size distribution (PSD) fundamentally affect the ink performance. Small changes in the PSD can often dramatically alter product performance. Small particle size provides excellent dispersion, color strength, saturation, gloss, hiding power and flow properties whereas large particle size provides poor dispersion (plate or cylinder wear, poor ink/water balance, hiccups, printability problems), unstable flows, poor hiding power, poor color strength (color fluctuation), and low gloss properties.

**Phase 1: Pigment Dispersion at Different Rotation Speed and Milling Time**

The pigment blue-15 powder was mixed in water under low shear for 20 min with different additives as outlined in Table 1. The pigment suspension sample was taken after proper mixing for measuring the particle size and particle size distribution (PSD). This suspension was then added to the mill. A constant air pressure was applied and the milling rotor speed set to 2000 rpm. The operating mode of constant power input was selected and maintained throughout the duration of the experiment. After 5, 10 and 20 passes a pigment suspension samples were taken for observing the particle size reduction. Again the same mixing and milling process was performed using the operative conditions described in the first experiment. In this case the milling rotor speed was increased to 4000 rpm.
In order to determine the particle size distribution of the pigment suspensions, the solution was diluted to get the appropriate intensity i.e. in between 200 to 400 counts, and then the particle size was measured with the NICOM 370 DLS particle sizing systems submicron analyzer. The particle size distribution and the volume mean diameter were determined by interpolating the distribution frequency of all particle size classes and by constructing an undersize cumulative plot, respectively.

**Phase 2: Dispersion at Different Pigment Concentration**

The pigment was dispersed under standardized laboratory conditions (4000 rpm and 10 pass) at three different concentrations shown in Table 2. Particle size and particle size distribution were measured by using the NICOM 370 DLS particle sizing systems submicron analyzer.

Table 1: Organic Color Pigment Dispersion Formulation

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount (%)</th>
<th>Amount (grams)</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigment</td>
<td>Heuco Blue - 15</td>
<td>35</td>
<td>210.0</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Resin (Joncryl HPD 96)</td>
<td>25.7</td>
<td>154.2</td>
</tr>
<tr>
<td></td>
<td>Surfactant (Surfynol T131)</td>
<td>5.0</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>Antifoam</td>
<td>0.5</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>33.8</td>
<td>202.8</td>
</tr>
</tbody>
</table>

Table 2. Summary of Pigment and Vehicle Ratio

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>By weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Case I</td>
</tr>
<tr>
<td>Pigment</td>
<td>Heuco Blue – 15</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Resin (HPD 96) - 25.7 %</td>
</tr>
<tr>
<td></td>
<td>Surfactant (T131)- 5 %</td>
</tr>
<tr>
<td></td>
<td>Antifoam- 0.5 %</td>
</tr>
<tr>
<td></td>
<td>Water - 33.8 %</td>
</tr>
</tbody>
</table>

**RESULTS AND DISCUSSION**

The Chi squared value is very high ranging from 5.48 to 16.2 and therefore the multimodal distribution is appropriate. Hence, based on the NICOMP distribution analysis, a comparison of particle size from Table 3 and Figure 1 shows the intensity mean diameter of the pigment blue decreasing with milling time. The experiment allowed a particle size reduction from 221 nm to 178 nm at 2000 rpm and 200 nm at 4000 rpm after 20 passes. A comparison of particle size shows larger reduction at 2000 rpm with increasing milling time. The lesser decrease in particle size for the 4000 rpm sample probably results from rheological properties of the dispersion. This needs to be confirmed with rheological measurements.

Table 3 shows the particle size distribution at zero passes 0.9 % of particles were found at a mean diameter of 14 nm, the 57.1 % of particles were found at a mean diameter of 140.5 nm and the 42 % of
particles were found at a mean diameter of 337 nm. Figure 2 shows that after 20 passes at 2000 rpm, 2.0 % of particles were found at a mean diameter of 27 nm, the 98.0 % of particles were found at a mean diameter of 180 nm, whereas Figure 3 shows that after 20 passes at 4000 rpm, 17.8 % of particles were found at a mean diameter of 63 nm, and 82.2 % of particles were found at a mean diameter of 225 nm. This shows the particle size distribution narrowing with an increase in milling time. From both the tables and figures it is shown that there is no significant reduction in particle size after 10 passes at 4000 rpm, but that the particle size is reduced at every pass, at least up to 20 passes at 2000 rpm.

In second phase of experiment, a comparison of particle size results at standardized laboratory condition from Table 4 and Figure 4 shows the intensity mean diameter of the pigment blue increasing with pigment concentration as agglomerates can be formed by collisions between particles, and as the probability of such collisions is proportional to the square of the particle concentration.

Table 3. Phase I: Intensity Wt. NICOM Distribution Analysis

<table>
<thead>
<tr>
<th>Rotation Speed</th>
<th>2000 RPM</th>
<th>4000 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milling Time (Passes)</td>
<td>0 5 10 20</td>
<td>0 5 10 20</td>
</tr>
<tr>
<td>I.M.D (Int. Mean Dia.)</td>
<td>221 209 199 178</td>
<td>221 208 203 200</td>
</tr>
<tr>
<td>Peak I M.D</td>
<td>14 0 0 0</td>
<td>14 0 0 0</td>
</tr>
<tr>
<td>(%)</td>
<td>0.9 0 0 0</td>
<td>0.9 0 0 0</td>
</tr>
<tr>
<td>Peak II M.D</td>
<td>140.5 95.3 82 27</td>
<td>140.5 98 78 63</td>
</tr>
<tr>
<td>(%)</td>
<td>57.1 29.5 21.2 2.0</td>
<td>57.1 23.8 18.6 17.8</td>
</tr>
<tr>
<td>Peak III M.D</td>
<td>337 257 227 180</td>
<td>337 250 225 225</td>
</tr>
<tr>
<td>(%)</td>
<td>42.0 70.5 78.8 98</td>
<td>42.0 76.2 81.4 82.2</td>
</tr>
</tbody>
</table>

Table 4. Phase II: Intensity Wt. NICOM Distribution Analysis

<table>
<thead>
<tr>
<th>Case</th>
<th>I (30 % Pigment)</th>
<th>II (35 % Pigment)</th>
<th>III (40 % Pigment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.M.D (Intensity Mean Diameter)</td>
<td>183</td>
<td>203</td>
<td>204</td>
</tr>
<tr>
<td>Peak I</td>
<td>M.D</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>(%)</td>
<td>0.30</td>
<td>0</td>
<td>1.70</td>
</tr>
<tr>
<td>Peak II</td>
<td>M.D</td>
<td>136</td>
<td>78</td>
</tr>
<tr>
<td>(%)</td>
<td>50.70</td>
<td>18.60</td>
<td>55.0</td>
</tr>
<tr>
<td>Peak III</td>
<td>M.D</td>
<td>396</td>
<td>225</td>
</tr>
<tr>
<td>(%)</td>
<td>49.0</td>
<td>81.40</td>
<td>43.3</td>
</tr>
</tbody>
</table>
Figure 1. The influence of Rotation Speed and Dispersion Time on Particle Size

Figure 2. NICOMP Particle Size Distribution Analysis (2000 RPM).
Figure 3. NICOMP Particle Size Distribution Analysis (4000 RPM)

Figure 4. The influence of Pigment Concentration on Particle Size
CONCLUSIONS

The pigment dispersion at 2000 rpm and 20 passes allowed a particle size reduction of 43 nm (I.M.D) whereas the pigment dispersion at 4000 rpm and 20 passes allowed a particle size reduction of 21 nm (I.M.D). Regardless of speed, there is significant reduction in particle size after every pass. The most effective time and speed seems to be 10 passes at 2000 rpm, since the particle size is reduced to about 200 nm, near to the ideal size for a blue pigment [1]. The particle size increases with pigment concentration because of aggregate formation at higher concentration, but appears to approach an asymptote of about 205 nm.

Because of the apparent effect of rpm on final particle size, rheological properties need to be measured.
REFERENCES