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The Last Months of Chaucer's Earliest Patron

BY

ALBERT STANBURROUGH COOK

PROFESSOR OF THE ENGLISH LANGUAGE AND LITERATURE
IN YALE UNIVERSITY

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ABBREVIATIONS

The following titles are cited by the name or abbreviation which occurs first in the line:

Azarius. See Petrus Azarius.
Baillie-Grohman (ed.), The Master of Game.
Barnes, History of Edward III.
Benvenuto (Sangiorgio), Chronicon (M. H. P., pp. 1337-1340).
Benvenuto (Sangiorgio), Historia Montisferrati (R. I. S. 23. 554-560).
Corazzini, Le Lettere Edite e Inedite di Messer Giovanni Boccaccio.
Cordey, Les Contes de Savoie et les Rois de France (Bibl. de l’École des Hautes Études, Vol. 89).
Corio, L’Historia di Milano, Padua, 1646, pp. 468-471.
Delachenal, Histoire de Charles V.
De Noirmont, Histoire de la Chasse en France.
De Sade, Mémoires pour la Vie de François Pétrarque.
Florio, World of Words.
Fracassetti, Lettere di Francesco Petrarca.
Giulini, Memorie Spettanti alla Storia della Città e Campagna di Milano ne’ Secoli Bassi, Milan, 1856.
Hutton, Giovanni Boccaccio.
Jovijs, l’Ita Duodecim Vicecomitum (Grævius, Thes. Antigg., Vol. 3).
Knighton, Chronicon (Rolls Series).
Körting, Petrarca’s Leben und Werke.
Lavisse, Histoire de France.
Leo, Geschichte von Italien.
Le Roulx, La France en Orient.
Magenta, I Visconti e gli Sforza nel Castello di Pavia.
Mézières, Pétrarque.
Michelet, Histoire de France, nouvelle édition.
Miller (William), The Latins in the Levant.
Rodd, The Princes of Achaia.
Rosmini, Dell’ Istoria di Milano.
Rossetti (Domenico), Poesie Minori del Petrarca, Vol. 3.
Rymer, Fadera.
Venturi, Storia dell’ Arte Italiana, Vol. 4.
Abbreviations

Walsingham, Historia Anglicana (Rolls Series).
Wells, Manual of the Writings in Middle English.

Fam. = Petrarch, Epistolæ de Rebus Familiaribus.
Kervyn = Froissart, Chroniques, ed. Kervyn de Lettenhove.
M. H. P. = Monumenta Historie Patriæ (unless volume and page are specified) Vol. 5 (Script. 3).
Morte Darthur, ed. Sommer.
Romans = Paulin Paris, Les Romans de la Table Ronde.
Sen. = Petrarch, Epistolæ Rerum Senilium.
Var. = Petrarch, Epistolæ Varie.

The numbered column of a double-columned page is here designated as 'page.'
I. INTRODUCTION

In my paper, The Historical Background of Chaucer's Knight (Trans. Conn. Acad. of Arts and Sciences 20. 161-240), I touched upon Chaucer's relations with Lionel, Duke of Clarence, and incidentally discussed (pp. 182-6) the statement reported by Speght to the effect that Chaucer had been present at the marriage of Lionel and Violante, daughter of Galeazzo II of Milan. It has seemed to me that a more detailed account than has hitherto appeared in print of Lionel's journey to Italy in 1368, of the circumstances attending his marriage, and of his brief life thereafter, might especially help, whatever its value to the biographer of Lionel, or to the student of England's relations with Italy in the 14th century, to determine the probability of Chaucer's visit to Italy on the occasion in question. The men and manners that he would have observed on the journey, even as a humble attendant of Prince Lionel, appeal so powerfully to the imagination, and would have contributed so significantly to his poetic education, that the student of Chaucer's life can hardly remain satisfied until the teasing question has been answered, or the impossibility of answering it has been in a measure demonstrated. It is with primary reference to Chaucer, then, that this study has been undertaken. The poet is never, it is true, in the foreground of the picture. At best he is a somewhat shadowy figure in the background. How far he can be said to emerge, it is left for the reader to determine. Meanwhile, certain other characters—knights, squires, men-at-arms, fair ladies, poets, statesmen, and even kings—will at least troop across the page, to some extent in their habits as they lived.
II. ITALY AND THE VISCONTI

The house of Visconti, Lords of Milan, and constant aggressors on neighboring states, large and small, had attained a degree of opulence and consideration which incited them to aim at alliances with royalty, not merely for their present satisfaction, but also thereby to attain their ulterior ends—the more rapid annexation of other lordships, and perhaps in time the complete subjugation of Italy. In order to understand something of what lay before Lionel when he should have crossed the Alps, it will repay us to glance at the situation of affairs in northern Italy, and at the character of the ambitious family which for more than a century had been rising from comparative obscurity to a certain eminence.

I. ITALY IN THE FOURTEENTH CENTURY

Italy in the 14th century is thus characterized by Sismondi, Fr.:

Le quatorzième siècle est une époque brillante pour l'Italie: dans aucun temps les lettres n'ont été cultivées avec plus d'ardeur, les savans accueillis, honorés avec plus d'enthousiasme; dans aucun temps de plus grandes lumières n'ont été acquises et généralement répandues parmi les hommes; dans aucun temps de plus nobles monuments du génie créateur, ou du travail opiniâtre de l'homme, n'ont été transmis à la postérité. Le renouvellement des lettres grecques et latines, la création de la langue italienne et de la poésie moderne, l'art d'enseigner la politique dans l'histoire, et de présenter aux hommes, par le récit des événemens, une leçon non moins attrayante qu'instructive, le perfectionnement de la jurisprudence, les progrès rapides de la peinture, de la sculpture, de l'architecture, et de la musique, sont dus plus particulièrement aux hommes du quatorzième siècle. Mais cette période, qui, à tant de titres, mérite une étude particulière, ne fut point heureuse pour l'humanité. Plusieurs des vertus qui relèvent le caractère des hommes, qui, en s'alliant à leurs passions, les ennoblissent, avaient presque absolument disparu: et des vices rebutans, des vices qui dégradent l'histoire que nous écrivons, avaient pris leur place. Dans les cours des princes, la bassesse rampante, la lâche flatterie, l'intrigue et le vice, étoient les moyens les plus assurés de parvenir. Les petits souverains donnaient

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1 6. 1-3 (chap. 38).
Italy in the Fourteenth Century

l' exemple de tous les crimes; une débauche grossière régnoit dans l'intérieur de leurs palais; le poison et l'assassinat étoient employés chaque jour par eux, comme les sauvegardes de leur gouvernement: des troupes d'assassins étoient entretenues à leurs gages; et une protection entière étoit assurée aux brigands, en retour des services qu'ils rendoient. Dans les familles des princes, la passion de régner n'étoit arrêtée par aucun crime; et elle excitoit des révolutions fréquentes, presque toujours préparées par une noire perfidie, et accomplies par des forfaits atroces, ou prévenues par une effrayante cruauté. Dans les tribunaux, un pouvoir arbitraire et souvent injuste faisoit de la punition des crimes un revenu pour le prince: soupunçonneux par avarice, il acquéroit des preuves par la torture, et punissoit les coupables par d'horribles supplices. Dans la politique, une ambition qui employoit la trahison plutôt que les armes, comme moyen de vaincre, détruisoit toute confiance dans les traités, toute sûreté dans les alliances, tout lien d'amitié entre les peuples. Dans la guerre, des troupes mercenaires, perfides et cruelles, sacrifioient leur souverain à l'ennemi qui vouloit les acheter, mettoient leur honneur à l'enchère, et, épargnant les armées qu'elles avoient à combattre, ne ruinoient que les campagnes paisibles et les citoyens innocens.

Elsewhere Sismondi, Fr., says:

Dans le quatorzième siècle, les individus se détachent davantage de la foule; ils attirent sur eux l'attention; ils la commandent par leurs hauts faits, leurs talens ou leurs crimes: mais l'on ne voit point la nation à laquelle ils appartiennent s'avancer dans aucune carrière; et tandis qu'eux-mêmes, comme des lumières errantes, brillent et cheminent en tous sens, les divers peuples qu'ils devroient guider s'égarent dans les sentiers tortueux de la politique; ils avancent et reculent tour à tour: les uns marchent à la liberté, les autres au despotisme; l'immoralité et la religion, la superstition et la philosophie, le courage et la pusillanimité dominent tour à tour, et l'on ne sauroit affirmer, après la révolution de tout le siècle, si aucun progrès a été fait dans aucun sens.

Macaulay says (Essay on Machiavelli):

The Crusades, from which the inhabitants of other countries gained nothing but relics and wounds, brought to the rising commonwealths of the Adriatic and Tyrrhenian seas a large increase of wealth, dominion, and knowledge. The moral and the geographical position of those commonwealths enabled them to profit alike by the barbarism of the West and by the civilization of the East. Italian ships covered every sea. Italian factories rose on every shore. The tables of Italian
money-changers were set in every city. Manufactures flourished. Banks were established. The operations of the commercial machine were facilitated by many useful and beautiful inventions. We doubt whether any country of Europe, our own excepted, have at the present time reached so high a point of wealth and civilization as some parts of Italy had attained four hundred years ago [written in 1827]. Historians rarely descend to those details from which alone the real state of a community can be collected. Hence posterity is too often deceived by the vague hyperboles of poets and rhetoricians, who mistake the splendor of a court for the happiness of a people. Fortunately, John Villani has given us an ample and precise account of the state of Florence in the early part of the fourteenth century. The revenue of the Republic amounted to three hundred thousand florins; a sum which, allowing for the depreciation of the precious metals, was at least equivalent to six hundred thousand pounds sterling: a larger sum than England and Ireland, two centuries ago, yielded annually to Elizabeth. The manufacture of wool alone employed two hundred factories and thirty thousand workmen. The cloth annually produced sold, at an average, for twelve hundred thousand florins; a sum fully equal, in exchangeable value, to two millions and a half of our money. Four hundred thousand florins were annually coined. Eighty banks conducted the commercial operations, not of Florence only, but of all Europe. The transactions of these establishments were sometimes of a magnitude which may surprise even the contemporaries of the Barings and the Rothschilds. Two houses advanced to Edward the Third of England upwards of three hundred thousand marks, at a time when the mark contained more silver than fifty shillings of the present day, and when the value of silver was more than quadruple of what it now is. The city and its environs contained a hundred and seventy thousand inhabitants. In the various schools about ten thousand children were taught to read; twelve hundred studied arithmetic; six hundred received a learned education.

2. LOMBARDY AND TUSCANY IN THE FOURTEENTH CENTURY

Sismondi, Eng., thus describes the condition of Lombardy and Tuscany:

Before thus entering within the walls of the principal cities, it is right to give a sketch of the general aspect of the country, particularly as the violent commotions which it experienced might give a false idea of its real state. This aspect was one of a prodigious prosperity, which contrasted so much the more with the rest of Europe that nothing but poverty and barbarism were to be found elsewhere. The
open country, designated by the name of \textit{contado}, appertaining to each city, was cultivated by an active and industrious race of peasants, enriched by their labor, and not fearing to display their wealth in their dress, their cattle, and their instruments of husbandry. The proprietors, inhabitants of towns, advanced them capital, shared the harvests, and alone paid the land-tax: they undertook the immense labor which has given so much fertility to the Italian soil—that of making dikes to preserve the plains from the inundation of the rivers, and of deriving from those rivers innumerable canals of irrigation. The Naviglio Grande of Milan, which spreads the clear waters of the Ticino over the finest part of Lombardy, was begun in 1179, resumed in 1257, and terminated a few years afterwards.\(^3\)

Men who meditated, and who applied to the arts the fruits of their study, practised already that scientific agriculture of Lombardy and Tuscany which became a model to other nations; and at this day, after five centuries, the districts formerly free, and always cultivated with intelligence, are easily distinguished from those half-wild districts which had remained subject to the feudal lords.

The cities, surrounded with thick walls, terraced, and guarded by towers, were, for the most part, paved with broad flagstones; while the inhabitants of Paris could not stir out of their houses without plunging into the mud. Stone bridges of an elegant and bold architecture were thrown over rivers; aqueducts carried pure water to the fountains. The palace of the podestàs and \textit{signorie} united strength with majesty. The most admirable of those of Florence, the Palazzo Vecchio, was built in 1208. The Loggia in the same city, the church of Santa Croce, that of Santa Maria del Fiore, with its dome, so admired by Michael Angelo, were begun by the architect Arnolfo, scholar of Nicolas di Pisa, between the years 1284 and 1300. The prodigies of this first-born of the fine arts multiplied in Italy: a pure taste, boldness, and grandeur struck the eye in all the public monuments, and finally reached even private dwellings; while the princes of France, England, and Germany, in building their castles, seemed to think only of shelter and defense. Sculpture in marble and bronze soon followed the progress of architecture: in 1300, Andrea di Pisa, son of the architect Nicolas, cast the admirable bronze gates of the Baptistery at Florence; about the same time, Cimabue and Giotto revived the art of painting, Casella music, and Dante gave to Italy his divine poem, unequaled in succeeding generations. History was written honestly, with scrupulous research, and with a graceful simplicity, by Giovanni Villani, and his school; the study of morals and philosophy began; and Italy, ennobled by freedom, enlightened nations till then sunk in darkness.

\(^3\) But the chronicles of Piacenza and Milan say that the Naviglio, running from Milan to Pavia, was constructed by Galeazzo in April, May, and June, 1365 (\textit{R. I. S.} xvi. 508, 735), at a price named. See also Magenta i. 284.—The notes here, and throughout this section, are mine. A. S. C.
The arts of necessity and of luxury had been cultivated with not less success than the fine arts: in every street, warehouses and shops displayed the wealth that Italy and Flanders only knew how to produce. It excited the astonishment and cupidity of the French or German adventurer, who came to find employment in Italy, and who had no other exchange to make than his blood against the rich stuffs and brilliant arms which he coveted. The Tuscan and Lombard merchants, however, trafficked in the barbarous regions of the west, to carry there the produce of their industry. Attracted by the franchises of the fairs of Champagne and of Lyons, they went thither, as well to barter their goods as to lend their capital at interest to the nobles, habitually loaded with debt; though at the risk of finding themselves suddenly arrested, their wealth confiscated, by order of the king of France, and their lives, too, sometimes endangered by sanctioned robbers, under the pretext of repressing usury. Industry, the employment of a superabundant capital, the application of mechanism and science to the production of wealth, secured the Italians a sort of monopoly through Europe: they alone offered for sale what all the rich desired to buy; and, notwithstanding the various oppressions of the barbarian kings, notwithstanding the losses occasioned by their own often-repeated revolutions, their wealth was rapidly renewed. The wages of workmen, the interest of capital, and the profit of trade, rose simultaneously, while every one gained much and spent little; manners were still simple, luxury was unknown, and the future was not forestalled by accumulated debt.

3. THE COMPANIES OF ADVENTURE

Sismondi, Eng., says:

The most immediate cause of the sufferings of the kingdom of Naples, and of all Italy, was the formation of what was called 'companies of adventure.' Wherever tyrants had succeeded to free governments, their first care had been to disarm the citizens, whose resistance was to be feared; and although a little industry might soon have supplied swords and lances, yet the danger of being denounced for using them soon made the subjects of these princes lose every military habit. Even the citizens of free towns no longer thought of defending themselves: their way of life had weakened their corporal strength; and they felt an inferiority too discouraging when they had to oppose, without defensive armor, cuirassiers on horseback. The chief strength of armies henceforth was in the heavy-armed cavalry, composed of men who had all their lives followed the trade of war, and who hired themselves for pay. The emperors had successively brought into Italy many of their countrymen, who afterwards passed into the service of the tyrant princes.
The Visconti and Della Scalas had sent for many to Germany, believing that these men—who did not understand the language of the country, who were bound to it by no affection, and who were accessible to no political passion—would be their best defenders. They proved ready to execute the most barbarous orders, and for their recompense demanded only the enjoyments of an intemperate sensuality.

But the Lombard tyrants were deceived in believing the German soldier would never covet power for himself, and would continue to abuse the right of the stronger for the advantage of others only. These adventurers soon discovered that it would be better to make war and pillage the people for their own profit, without dividing the spoil with a master. Some men of high rank, who had served in Italy as condottieri (hired captains), proposed to their soldiers to follow them, make war on the whole world, and divide the booty among themselves. The first company, formed by an Italian noble at the moment that the Visconti dismissed their soldiers, having made peace with their adversaries, made an attack suddenly on Milan, in the hope of plundering that great city; but was almost annihilated in a battle, fought at Parabiago, on the 20th of February, 1339. A German duke, known only by his Christian name of Werner, and the inscription he wore on his breast of 'enemy of God, of pity, and of mercy,' formed, in 1343, another association, which maintained itself for a long time, under the name of 'the great company.' It in turns entered the service of princes; and, when they made peace, carried on its ravages and plunderings for its own profit. The duke Werner and his successors—the count Lando, a German; and the friar Moriale, knight of St. John—devastated Italy from Montferrat to the extremity of the kingdom of Naples. They raised contributions by threatening to burn houses and harvests, or by putting the prisoners whom they took to the most horrible tortures. The provinces of Apulia were, above all, abandoned to their devastations; and the king and queen of Naples made not a single effort to protect their people.

There now remained no more than six independent princes in Lombardy. The Visconti, lords of Milan, had usurped all the central part of that province; the western part was held by [the Counts of Savoy and] the Marquis[es] of Montferrat, and the eastern by the Della Scala, lords of Verona, Carrara of Padua, Este of Ferrara, and Gonzaga of Mantua. These weaker princes felt themselves in danger, and made a league against the Visconti, taking into their service the great company; but, deceived and pillaged by it, they suffered greater evils than they inflicted on their enemies.

* So Sismondi, Fr., 8. 27.
4. THE HOUSE OF VISCONTI

The dynasty of the Visconti is thus\(^5\) characterized by Sismondi, Fr.:

Cette dynastie eut l'avantage presque inouï d'avoir successivement six\(^6\) chefs également distingués. La couronne ne passa point des pères aux enfants, et n'entretint point une mollesse héritéditaire; la dissimulation, l'égoïsme et le vice, ne formèrent point l'éducation nécessaire des légitimes successeurs du grand Othon; la même lutte, les mêmes vicissitudes de fortune qui développèrent son énergie, agirent tout aussi puissamment sur son frère et ses neveux: tous les six eurent tour à tour lutte avec la fortune; et l'archevêque Jean Visconti, qui mourut le dernier, en 1354, avait appris, comme ses devanciers, à connaître les hommes, lorsqu'il était persécuté et exilé. Il soumit à son pouvoir Gênes, Bologne, et presque toute la Lombardie; il tenta d'envahir la Toscane et l'état de l'Eglise, et peut-être fut-il plus près qu'aucun autre prince du quatorzième siècle, de s'assurer la souveraineté de toute l'Italie. Cependant il excita la défiance de ses voisins, par sa dissimulation et sa perfidie, plus que par ses conquêtes; et les vices par lesquels il croyait vaincre, arrétèrent ses victoires et mirent obstacle à sa grandeur.

L'archevêque Jean Visconti fut le dernier des princes de cette famille qui eut quelque magnanimité dans le caractère: mais la passion des conquêtes, le désir insatiable de dominations nouvelles demeurèrent à ses successeurs, quoiqu'ils n'héritassent point aussi des qualités plus brillantes de ce prince. La maison Visconti, jusqu'à son dernier rejeton, ne renonça point aux projets que ses premiers chefs eurent formés, pour asservir l'Italie; elle employa désormais les arts de la foiblesses au lieu de ceux de la force, la perfidie et l'intrigue de préférence aux armes; mais elle tendit constamment au même but.

Bernabos, Galéaz son frère, et Jean Galéaz, fils du dernier, qui leur succéda, étoient des hommes timides autant qu'ambitieux; leur cruauté, leur avarice et leurs exactions, les rendirent odieux à leurs sujets; ils causèrent la ruine des provinces qui leur étoient soumises, par les guerres continuelles qu'ils entretenirent: le commerce fut détruit, les manufactures firent abandonnées, l'agriculture elle-même fut négligée; et plusieurs de ces fertiles campagnes de la Lombardie, qui promettaient au travail de si riches récompenses, demeurèrent désertes. Les dévastations des gens de guerre, et le poids des impositions, étouffèrent toute industrie. Cependant Bernabos et Jean

\(^5\) S. 23-26 (chap. 57).

\(^6\) Otto, Matteo I, Galeazzo I, Azzo, Luchino, Giovanni (1349-54). These were followed by Matteo II (1354-5), with Galeazzo II (1354-78), and Bernabò (1354-85); to Galeazzo II succeeded Gian Galeazzo (1378-1402).
Galéaz, si mauvais économès de la fortune de leurs peuples, savoient maintenir l'ordre dans l'administration de leurs propres finances; et ce fut la cause principale de leurs succès. Ils disposèrent en tout temps d'un plus ample revenu qu'aucun de leurs adversaires; et ils l'employèrent, d'une main libérale, à récompenser leurs serviteurs fidèles, à maintenir le dévouement des petits états qui s'étoient attachés à eux, enfin à se procurer des partisans ou des traîtres dans les conseils de leurs voisins ou de leurs ennemis. Tandis qu'ils ne ménageoient point leurs trésors pour atteindre le but de leur politique, ils n'avoient garde de les dissiper par une prodigalité insensée; aussi se trouvoient-ils prêts au combat lorsque leurs adversaires avoient déjà épuisé toutes leurs forces, et se sentoient-ils presque assurés de vaincre toutes les fois qu'ils gagnoient du temps.

Tant que Galéaz avoit vécu, et qu'il avoit partagé avec son frère Bernabos l'administration des affaires, ses vices particuliers avoient mis obstacle au progrès des armes du seigneur de Milan; car il étoit étranger à la sage économie de son frère et de son fils: l'amour de la pompe et d'une grandeur apparente, détruisoit ses forces réelles; il dépensa des sommes prodigieuses pour élever des bâtiments somptueux; il en prodigua de plus grandes encore pour allier sa famille, par d'illustres mariages, aux monarques de l'Europe. Mais lorsque Jean Galéaz, son fils, après avoir réuni ses états à ceux de Bernabos, eut rétabli l'ordre dans les finances, il étendit dans tous les sens les limites de sa domination; et il aurait infailliblement asservi toute l'Italie qui n'avait plus de force pour lui résister, si une mort inattendue n'avait tout-à-coup arrêté sa carrière.

Sismondi, Eng., says:

Azzo Visconti, the son of that Galeazzo who had been so treacherously used by Louis of Bavaria, had, in 1328, purchased the city of Milan from that emperor, and soon afterwards found himself master of ten other cities of Lombardy; but he died suddenly, in the height of his prosperity, the 16th of August, 1339. As he left no children, his uncle Luchino succeeded him in the sovereignty. Luchino was false and ferocious, but clever, and possessed in war the hereditary talent of the Visconti. He was called a lover of justice, probably because he punished criminals with an excess of cruelty, and maintained by terror a perfect police in his states. He died, poisoned by his wife, on the 23d of January, 1349. His brother John, Archbishop of Milan, succeeded him in power. The latter found himself master of sixteen of the largest cities in Lombardy; cities which, in the preceding century, had been so many free and flourishing republics. His ambition continually aspired to more extensive conquests; and on the 16th of October, 1350, he engaged the brothers Pepoli to cede to him Bologna. . . .

He [John Visconti] died on the 5th of October, 1354, before he could renew attacks [on Florence]; and his three nephews, the
sons of his brother Stephen, agreed to succeed him in common. The eldest, who showed less talent for government, and more sensuality and vice, than his brothers, was poisoned by them the year following. The two survivors, Barnabas and Galeazzo, divided Lombardy between them; preserving an equal right on Milan, and in the government...

The two brothers Visconti, masters of Lombardy, had at their disposal immense wealth and numerous armies; and their ambition was insatiable. They were allied by marriage to the two houses of France and England; their intrigues extended throughout Italy, and every tyrant was under their protection. At the same time, their own subjects trembled under frightful cruelties. They7 shamelessly pub-

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7 The edict was due to Galeazzo alone, so far as appears (R. I. S. 16. 410), and is assigned by Sismondi, Fr., who wrongly attributes it to Bernabò (6. 302-3), to 1359. For an account of these tortures, see Sismondi, Fr., 6. 302-3; Leo 3. 311-2. The following account is directly from the original.

The tortures, which were to be inflicted on traitors and their accomplices, that is, according to Rosmini (2. 113), on all who had opposed him in the recent war, or favored his enemies, were to extend over a period of 41 days, and terminate in death. All the even days of the series were to be spent in recuperating from the agonies inflicted on the odd days, so that there were 21 days of active torment. Only specimens will be here described. They began with the strappado, which consisted of attaching a rope to the condemned, perhaps typically to his hands joined behind his back, and letting him fall, but not to the ground, the length of a rope suspended from a beam. This was done five times a day for days 1, 3, 5, and 7. On days 9 and 11, lime, vinegar, and water were given him to drink. On day 15 the soles of the feet were flayed, and the wretch walked upon peas, the walking to be repeated on day 17. On days 19 and 21, the rack. On day 23, one eye gouged out; 25, the nose cut away; 27, one hand chopped off; 29, the other hand; 31, one foot, etc. On the last day, the sufferer was laid on a cart, and his flesh torn with pincers; following which, he was broken on the wheel ('intenaglìetur super plausstro, et postea in rota ponetur'). If we reflect how easily the stigma of treason could be fastened on a person, that there was no appeal from a sentence, that these punishments were actually inflicted on numbers of persons in 1362 and 1363 (R. I. S. 16. 411), and that Galeazzo was the less sanguinary of the two brothers, we shall be in a position to estimate one aspect at least of the character of the Visconti.

For Galeazzo's character in general, see R. I. S. 16. 402-5; cf. Muratori 8. 382; Rosmini 2. 140-143; Leo 3. 323-4. He has been called the wealthiest and most magnificent Italian of his epoch (Encyc. Brit., 11th ed., 15. 38). For the pious foundations which he established on March 27, 1374, see Giuliani 7. 240-243. He died on Aug. 4, 1378, aged 59 years (Corio, p. 495).
lished an edict, by which the execution of state criminals was prolonged to the period of forty days. In it the particular tortures to be inflicted, day by day, were detailed, and the members to be

mutilated designated, before death was reached. On the other hand, their finances were in good order; they liberally recompensed their partisans, and won over traitors in every state inimical to them. They pensioned the captain of every company of adventurers, on con-
dition that he engaged to return to their service whenever called upon. Meanwhile, these captains, with their soldiers, overran, plundered, and exhausted Italy, during the intervals of peace; reducing the country to such a state as to be incapable of resisting any new attack. All the Ghibelines, all the nobles who had preserved their independence in the Apennines, were allied to the Visconti. The march of these usurpers was slow, but it seemed sure. The moment was foreseen to approach when Tuscany would be theirs, as well as Lombardy; particularly as Florence had no aid to expect either from Genoa or Venice. . . .

Urban V, on his arrival in Italy, endeavored also to oppose the usurpations of the Visconti, who had just taken possession of San Miniato, in Tuscany, and who, even in the states of the church, were rendering themselves more powerful than the Pope himself. Of the two brothers, Barnabas Visconti was more troublesome to him by his intrigues. Urban had recourse to a bull of excommunication, and sent two legates to bear it to him; but Barnabas forced these two legates to eat, in his presence, the parchment on which the bull was written, together with the leaden seals and silken strings.8 . . .

8 The story here told (from R. I. S. 17. 160, 162) is assigned to a quite different period by R. I. S. 16. 800-801, according to which the Pope was Innocent VI, and Urban was one of the two legates; cf. Rosmini 2. 104, note 2; Leo 3. 310. Giulini (5. 465-6) would date the occurrence in 1361. For a story still more scandalous, see R. I. S. 15. 911.

The long list of Bernabò's crimes and cruelties may be found in R. I. S. 16. 794-801. See also R. I. S. 16. 397, 399-400, 735-6, 742-3; Corio, pp. 486-7; Matteo Villani (in R. I. S., Vol. 14) 6. 28; 7. 48; 9. 50; cf. Muratori 8. 413; Giuliani 5. 550, 559, 653; Rosmini 2. 115, 153-4. A few particulars may be mentioned: his notorious edict concerning the maintenance of his 5,000 hunting dogs (R. I. S. 16. 794; Rosmini 2. 115; Leo 3. 312); he hanged those who caught partridges (R. I. S. 16. 794, 795); burned to death four nuns (ib., p. 795); had his jugglers or buffoons burn to death in an iron cage an Augustinian monk (p. 795); would frequently ask those about him, 'Do you not know that I am God on earth?' (p. 795); ordered that no official should receive his salary till he had caused one or more poachers of partridges to be beheaded (p. 796); had a wife burned to death by her own husband (p. 796); had a man's eyes put out, because he was found on Bernabò's private street (p. 796); had a man hanged because he had not fully paid a woman for two capons (p. 796); had two of his chancellors shut up in an iron cage with a wild boar till they died (p. 796); had a country fellow killed because he crossed a street with a dog (p. 796); in December, 1384, had a boy's eye put out, and his hand cut off, because he had dreamed that he had taken and burned a wild boar belonging to Bernabò (p. 797); caused a Doctor of Laws, an excellent man, who had declined to obey an unjust order of his, to be beaten severely with rods, then
Barnabas, grown old, had divided the cities of his dominions amongst his numerous children. His brother, Galeazzo, had died on the 4th of August, 1378, and been replaced by his son, Gian Galeazzo, called Count de Virtus, from a county in Champagne, given him by Charles V, whose sister he had married. Barnabas would willingly have deprived his nephew of his paternal inheritance, to divide it among his children. Gian Galeazzo, who had already discovered several plots directed against him, uttered no complaint, but shut himself up in his castle of Pavia, where he had fixed his residence. He doubled his guard, and took pains to display his belief that he was surrounded by assassins. He affected, at the same time, the highest devotion: he was always at prayers, a rosary in his hand, and surrounded with monks; he talked only of pilgrimages and expiatory ceremonies. His uncle regarded him as pusillanimous, and unworthy of reigning. In the beginning of May, 1385, Gian Galeazzo sent to Barnabas to say that he had made a vow of pilgrimage to our Lady of Varese, near the Lago Maggiore, and that he should be glad to see him on his passage. Barnabas agreed to meet him at a short distance from Milan, accompanied by his two sons. Gian Galeazzo arrived, surrounded, as was his custom, by a numerous guard. He affected to be alarmed at every sudden motion made near him. On meeting his uncle, however, on the 6th of May, he hastily dismounted, and respectfully embraced him; but, while he held him in his arms, he said, in German, to his guards, 'Strike!' The Germans, seizing Barnabas, disarmed and dragged him, with his two sons, to some distance from his nephew. Gian Galeazzo made several vain attempts to poison his uncle in the prison into which he

forced to cut out another man's tongue, and finally to drink a cup of poison (p. 797); and tried to have Gian Galeazzo poisoned (p. 798). See also pp. 48-9. In the very year of Lionel’s marriage, Bernabò issued a mandate that when he rode through the streets of Parma, every one should bow the knee, and do him reverence (R. I. S. 16. 740-741).

For an amusing story of Bernabò’s encounter with a rustic, see R. I. S. 16. 393-6, cf. 743.

The little good that could be said of him will be found in R. I. S. 16. 801; Corio, p. 509.


At one particular time Bernabò is reported to have had 36 children, and 18 women to have been with child by him (R. I. S. 16. 800). He is accused, when already advanced in years, of keeping a regular harem (16. 799).

10 R. I. S. 15. 510, 1082; 16. 543. 784-5, 853; 17. 497-9, 1126-7; 18. 92-3, 195-6, 525-6; 19. 785-6; Corio, p. 506; cf. Muratori 8. 412-4; Giuliani 5. 653-5; Rosmini 2. 153-5; Leo 3. 327-8; Symonds, Age of the Despots, chap. 2.
Italy and the Visconti

had thrown him; but Barnabas, suspicious of all the nourishment offered him, was on his guard, and did not sink under these repeated efforts till the 18th of December of the same year."
All Lombardy submitted, without difficulty, to Gian Galeazzo. His uncle had never inspired one human being with either esteem or affection. The nephew had no better title to these sentiments. False
and pitiless, he joined to immeasurable ambition a genius for enterprise, and to immovable constancy a personal timidity which he did not endeavor to conceal. The least unexpected motion near him threw him into a paroxysm of nervous terror. No prince employed so many soldiers to guard his palace, or took such multiplied precautions of distrust. He seemed to acknowledge himself the enemy of the whole world. But the vices of tyranny had not weakened his ability. He employed his immense wealth without prodigality; his finances were always flourishing; his cities well garrisoned and victualed; his army well paid; all the captains of adventure scattered throughout Italy received pensions from him, and were ready to return to his service whenever called upon. He encouraged the warriors of the new Italian school: he well knew how to distinguish, reward, and win their attachment. Many young Italians, in order to train themselves to arms, had, from about the middle of this century, engaged in the German, English, and French troops, which inundated Italy; and they soon proved that Italian valor, directed by the reflection and intelligence of a highly civilized nation, who carried their arms as well as tactics to perfection, had greatly the advantage over the brute courage of barbarians.\(^\text{12}\)

The influence of Gian Galeazzo in overthrowing the last remains of liberty in Italy has been thus described\(^\text{13}\):

L'esprit de liberté semboit s'éteindre dans toute l'Italie. . . . Cette terre, autrefois si fertile en citoyens et en héros, semboit désertée par toutes les vertus et tous les sentiments élevés. Un tyran lâche et perfide prenoint à tâche de détruire chez les Italiens tout ce qui portoit encore l'image de la loyauté et de l'honneur: il n'attendoit des succès qu'en proportion des vices des peuples; et il se réjouissoit de voir un gouvernement adopter sa politique frauduleuse, assuré dès-lors qu'il parviendroit bientôt à le dominer. Tels étoient les funestes présages qui accompagnaient la fin du quatorzième siècle. La peste enfin se déclaroit en même temps dans plusieurs parties de l'Italie; et les peuples, effrayés de tant de fléaux, y reconnoissoient les châtimens qu'ils avoient mérités, et se courboient devant la majesté divine, pour implorer sa miséricorde.

Lodi (\textit{R. I. S.} 16. 786; Giulini 5. 659; Rosmini 2. 157), were kept at Trezzo, where they were well treated, but closely guarded (\textit{R. I. S.} 16. 545, 800, 855; Giulini 5. 662; Rosmini 2. 157; Leo 3. 329).

\(^\text{12}\) Cf. Corio, p. 562; Rosmini 2. 207-212; Symonds, \textit{Age of the Despots}, chap. 2. He was rather less than 51 years old when he died (Oct. 15, 1351—Sept. 3, 1402).

\(^\text{13}\) Sismondi, Fr., 7. 394-5 (chap. 55).
III. THE CONSIDERATIONS WHICH DETERMINED THE ALLIANCE

The negotiations for the marriage of Lionel with Violante were perhaps begun by Amedeo, Count of Savoy.\(^1\) Cordey, referring to the cession of three towns to Amedeo by Galeazzo on Nov. 22, 1366, adds: 'C'était peut-être un encouragement,

\(^1\) See p. 34. De Sade says (p. 720) that the English in Galeazzo's pay suggested the idea of the alliance, and helped him to secure it, and Rosmini (Dell' Istoria di Milano 2. 119-120) speaks of 'quest' alleanza segnatamente da Galeazzo contratta per conciliarsi l'affetto, e valersi dell' opera della famosa compagnia degli' Inglesi condotta da Giovanni Aucud'; to a similar effect Sismondi, Fr., 7. 21-2; Leo 3. 318. It is no doubt true that the relations of Hawkwood and Bernabò began as early as the summer of 1365 (Temple-Leader and Marcotti, \textit{Sir John Hawkwood}, p. 47), and very likely the success of the English in their recent wars may have inspired a wholesome respect in the breasts of the Visconti. We have only to think of Poitiers (1356) and the Peace of Bretigny (1360), for instance. The ransom required for the release of King John has the credit of having brought to pass the marriage of Gian Galeazzo to Isabella of France (cf. below, pp. 36, 49), which cost Galeazzo 600,000 florins (Körting, p. 349; Lavisse 4.\(^1\) 159-160; Delachenal 2. 231-7), Piacenza alone paying 25,000 of this amount (\textit{R. I. S.} 16. 512).

In 1361 Petrarch was sent to Paris to condole with King John on his misfortunes and to return a ring which he had lost at the battle of Poitiers, and which had been redeemed by the Visconti (Mézières, \textit{Pétrarque}, p. 322). This mission caused him to realize the power of the English, as is apparent from a letter written not long afterwards (\textit{Fam.} 22. 14):

'When I was in my teens the English were considered the least courageous of all the barbarians [Corio, p. 462, calls the English 'questi Barbari'], but now this most warlike people have so frequently and unexpectedly defeated the French, long famous for military exploits though they had been, that they who had showed themselves no match for even the contemptible Scots [Bannockburn, 1314; Berwick, 1318] have so wasted the whole realm with fire and sword—not to speak of the ill-fortune of the French king [John], which I can not call to mind without a sigh—that, when I lately made a journey thither on public business, I could hardly persuade myself that I was looking at the same kingdom. Everywhere was solitude, devastation, and sadness; everywhere fields untilled and neglected; everywhere houses in ruins and abandoned, save as they
were protected by the walls of cities or castles; everywhere the melancholy traces of the English, and the fresh and horrible scars left by their swords' ('Adolescentulo me, Britannii, quos Anglos sive Anglicos vocant, omnium barbarorum timidissimi habebantur; nunc bellicosissima gens Gallos diu bellica gloria florentes stravit tam crebris insperatisque successibus, ut qui modo vilibus Scotis impares fuerant, præter miserabilem et indignum regis casum, quem sine suspicio meminisse non possum, sic regnum omne igne ferroque contriverint, ut mihi nuper illuc iter ex negotio agenti vis persuaderi posset regnum illum esse quod videram. Sic ubique solutio infelix et moeror et vastitas; sic ubique horrida et inculta arva, sic dirute desertæque domus, nisi que cinctæ arciuncæ menibus aut urbium evasisent, sic demum omnibus locis Anglorum mæsta vestigia et recentes fœdæque cicatrices gladiorum extabant').

For the customs and modes of war practised by the English in Italy, see Temple-Leader and Marcotti, Sir John Hawkwood, pp. 20, 21, 39-42. The following account is translated from Filippo Villani, chap. 81 (R. I. S. 14. 746), and was published in the Bibl. Topograph. Brit. 6 (1790). 43-44:

'These English were all lusty young men, most of them born and brought up in the long wars between the French and English; warm, eager, and practised in slaughter and rapine, for which they were always ready to draw their swords, with very little care for their personal safety, but in matters of discipline very obedient to their commanders. However, in their camps or cantonments, through a disorderly and over-daring boldness; they lay scattered about in great irregularity, and with so little caution that a bold, resolute body of men might in that state easily give them a shameful defeat. The armor of almost all were cuirasses, their breasts covered with a steel coat of mail, gauntlets, and armor for the thighs and legs, daggers, and broad swords; all of them had long tilting-lances, which, after dismounting from their horses, they were very dextrous in handling. Every man had one or two pages, and some of them more, according to their ability to maintain them. On taking off their armor, it was the business of their pages to keep them clean and bright, so that when they came to action their arms shone like looking-glass, and thus gave them a more terrifying appearance. Others among them were archers, their bows long, and made of yew. They were very expert and dextrous in using them, and did great service in action. Their manner of fighting in the field was almost always on foot. The horses were given in charge to the pages. The body they formed was very compact, and almost round; each lance was held
commission had been issued by Edward III to Humphrey de Bohun, Earl of Hereford, and Sir Nicholas Tamworth, to treat with Galeazzo concerning a marriage between Lionel\(^2\) and Violante.\(^3\) According to a parallel commission, Edmund, Earl of Cambridge, Edward’s fifth son, might be substituted for Lionel. Lionel and Edmund, as younger sons, had to be provided for, the Black Prince, the heir to the throne, having already a realm of his own in Aquitaine. Ireland was not a realm to content Lionel, so he was seeking a more desirable province abroad, as John of Gaunt did in Spain.\(^4\)

If the Green Count was instrumental in the earliest stage of the negotiation, then it must have been before July, 1366. That the advances were made from the Italian side is definitely stated by two men in the same manner as the spear is handled in hunting the wild boar; and thus close embodied, with their lances pointed low, and with slow steps, they marched up to the enemy with terrible outcry, and very difficult was it to break or disunite them. But after all, experience has shown they were more fit for night-excursions and plundering villages than for keeping the field; and their success was more owing to the cowardice of our own men than their valor and military virtue. They had very curious ladders in pieces, the biggest of which was of three steps, and one piece socketed into the other like so many trumpets, and with these they were able to mount the top of the highest towers.'

Muratori (8, 343) says that, in the death of Lionel, Galeazzo lost the hope of assistance from the King of England, and Sismondi (op. cit. 7. 22) that it severed his alliance with the companies of adventurers.

\(^2\) Rymer.

\(^3\) Cf. Hist. Background, pp. 182-3. On July 18 Hereford (1341-1373) had appointed an attorney, in view of his approaching trip abroad; and he was still absent from England on Nov. 28 (Cal. Pat. Rolls). Of him Froissart wrote (Buisson de Jonece 263-4):

\[
\text{Aussi dou conte de Herfort } \\
\text{Pris une fois grant reconfort.}
\]

He was the father-in-law of Henry, Earl of Derby, had headed the escort of Pierre I, King of Cyprus, from Dover to London, early in November, 1362 (Jorga, Philippe de Mézières, p. 179), and had been with Pierre at Satalia and Ayas (Chaucer’s ‘Lyeys’) in 1367 (Hist. Background, pp. 182, 232-3).

\(^4\) Cf. Michelet 6. 4.
by the *Chronicle of Montferrat*, and is no less clear in the light of an offer drawn up by Galeazzo at Pavia on Jan. 19, 1367 (Rymer). In this offer, made as a basis for a marriage-contract,

Piedmont and the Adjacent Regions.

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5 'Cercò anchora questo signor Galeatio Visconte de dar in matrimonio Violante . . . al signor Leonetto,' etc. Cf. Corio: 'Galeazzo fece amicitia col Re d'Inghilterra.' It is interesting that the Visconti, as Counts of Angiara, 'did not blush to be called English (*Angli*), as descended from Anglo, reputed to be the son or grandson of *Æneas* (Carlo Muletti, p. 15 of Preface to Goffredo della Chiesa; Corio, p. 9). Gian Galeazzo's three sons were Gian Maria Inglese, Filippo Maria Anglo (both afterwards Dukes of Milan), and Gabriele Anglo (Corio, p. 561, cf. 543, 568), while a daughter of Bernabò was named Inglese (R. I. S. 17, 499), or Anglesia (Corio, p. 509). An odd theory to account for these names is that of Rawdon L. Brown (*Cal. of State Papers and Manuscripts . . . in the Archives and Collections of Venice* i. 252, note): 'It seems probable that the Visconti family had been naturalized by Edward III in 1365 [sic], when Lionel, Duke of Clarence, married Violante Visconti.' Muletti refers to the apocryphal genealogy given in *M. H. P.*, pp. 869-870; cf. his Preface, as above, and p. 871, note.
Galeazzo refers to earlier negotiations. The terms offered in the draft are briefly these:

(1) The gift as dowry of Galeazzo's Piedmontese territories—
   (a) the city of Alba, and the towns of Cherasco, Mondovi, and
   Cuneo, without qualification; (b) the overlordship of Centallo
   and Carru, which had already been granted as a fief by Galeazzo
   to Pandolfo Malatesta, some time his captain-general. These
   towns are guaranteed to produce a yearly net income of 24,000
   florins of Florence.

(2) The dowry is also to include an annual income in cash
   of 50,000 florins, payable in Milan, Calais, or London. If this
   sum seems insufficient, the amount may be determined by the
   Earl of Hereford and Giovanni de' Pepoli, or their substitutes.

(3) If Edward and Lionel do not care for the towns, but
   prefer a lump sum, Galeazzo offers 250,000 florins, payable as
   above.

(4) Violante is to be sent at Galeazzo's expense, with a
   splendid outfit, from Milan or Pavia to Calais.

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6 'Cum . . . aliqua verba et tractatus sint mota et incepta de con-
trahendo parentellam et matrimonium, videlicet de copulando, legitimo
matrimonio, prefato domino Leonelo illustrem Violantem,' etc. (Rymer).
By this time, then, the choice had fallen upon Lionel. Perhaps the latter's
return from Ireland in November, 1366 (Hist. Background, p. 180) points
to the same conclusion.

7 According to the Italian chroniclers, the towns were Alba, Mondovi,
   Cherasco, Cuneo, Demonte, Centallo, Cavurro (Cavour), Roccasparviera,
   and Brà, besides others not named. The first three named above are
   mentioned by all the original authorities; Cuneo is omitted only by
   Benvenuto; Demonte is mentioned by Annu. Med., Cron. Monf., and
   Chron. Plac.; Brà (Braida) only by Corio, and Centallo and Cavurro
   only by Cron. Monf. Petrus Azarius (quoted by Benvenuto), Cron.
   Monf., and Cron. Saluz specify that the territories ceded include all those
   possessed by Galeazzo in Piedmont, Cron. Saluz. subjoining: 'et alte
   ancora.' Benvenuto adds to his list: 'et reliqua oppida'; Annu. Med.:
   'plura alia loca'; Chron. Plac.: 'et plura alia.' Cf. Gabotto, in Misc. di
   Stor. Ital. 33. 168; Corio, p. 448; Sismondi, Fr., 7. 21.

    According to Cron. Monf., Alba was rated at 549 gold florins; Cherasco
    at 429; Cuneo and Demonte together at 419; Centallo at 25; Cavurro at
    30; while Roccasparviera is not rated.

    Carru is mentioned by Cron. Saluz. (M. H. P., p. 1018, cf. p. 996) as
    belonging to Galeazzo in December, 1369.

8 See R. I. S. 16. 404.

The definitive marriage-treaty was made at Westminster on May 15, 1367, the terms being much the same as in the draft (Rymer). For example, (1) is the same, except that Galeazzo retains the overlordship of Piedmont, so that Lionel and Violante, and their heirs, owe him fealty and homage; for (2) is substituted the transfer of a lump sum of 100,000 florins, payable

10 Barnes, Sandford, and the Dict. Nat. Biog. say that on April 25, 1368, the marriage-treaty was signed at Windsor, and the 100,000 (Barnes, 10,000) florins paid; but by this time Lionel was well on his way to Italy.
11 Walsingham (I. 306; so Chron. Angi., p. 62) says that Lionel was to obtain half of Galeazzo's dominions. Hardyng is more extravagant (pp. 332-3):

The duke of Milayn, hight sir Bernabo,
The lord Mantowe & the marques Ferrar,
The lord of Mountpollestrme then also,
The lordes of Jene, of Pyse that then were,
The lordes of Venis and Florence there,
To kyng Edward sent ambassiate,
By commen assent of papall senate,
For Lionell his soonne with theim to send
The duke his daughter of Mclayn for to wed,
Promisyng then hym so to recommend
That of Itale the rule sholde all be led
By hym and his frendes of Italye bred,
And in short tyme to joye and bere the crowne
Of all Italye the royal region.

This is bombastically paraphrased and amplified by Barnes, p. 718.
12 This is confirmed by Petrus Azarius and Cron. Salus. Corio (p. 468) and Jovius say 200,000 (and Barnes 2,000,000!). Corio comments that such a dowry was, so to speak, the final ruin of Galeazzo's state, and Petrus Azarius has the phrase, 'cum infinito dispendio.' Jovius (op. cit. 3. 313), in deploring Galeazzo's fatal extravagance, associates the marriage of Violante with that of Gian Galeazzo to Isabella of France (see below, p. 49):

'Et modo pace parta, et Barnaba nihil secius pertinaci studio Bononie principatum, tanquam sibi fraude eripatum, validis armis repetente, Galeacios exterar annimatis, decora quidem regio fastu, sed sibi et posteris damnosas et fere exitiales quasivit, Isabella scilicet, Caroli Galliae Regis sorore, Joanni Galeacio filio expetita, Leonatoque Clarentio, Britanniae Regis filio, in generum adscito: huic enim ex nuptiis Violantis, quum ducenta millia aureorum numnum dotis nomine recepisset, Mons etiam Regalis atque Alba Pompeia urbes cesserunt. Isabella autem, quæ Mediolanum venerat, usque adeo socero gravis fuit, ut ducentis millibus aureorum constiterit; quan-
to Edward III at London or Calais, of which 50,000 may be paid down at once. Minor details are subjoined. The first of these resembles (4): Violante is to be amply provided with clothes and furniture, and to be sent in honorable state to Calais within six years, if the king so wishes. Further, if Violante should die without an heir, neither the king nor Lionel is to be held to restoration of the money, or of Violante’s personal belongings. Should Lionel die, Violante shall keep her jewels, and inherit one-third of the real property of which he shall die seized. Should Lionel die without leaving a child by Violante, the lands assigned as dowry shall revert to Galeazzo or his heirs. If the king needs Lionel, he is to be free at any time to return from Lombardy. If Lionel is made prisoner, while serving with Galeazzo against the latter’s enemies, Galeazzo is to provide his ransom. The Black Prince is to be consulted regarding this treaty; if he has no objection, it is to be considered as binding. Galeazzo is to be adjured to add to the territories promised. His ambassadors disclaim any power to bind Galeazzo as respects the treaty, which, in all its articles, is to be referred to him for his final approval and consent.

What was promised by treaty was not, in fact, all that the wedded pair received. The *Chronicle of Montferrat* specifies the following gifts made to them on the day of their marriage:

quam Virtutis oppidi ditio, honestissimaeque appellationis titulus, novo sponso nomine dotis accessisset.'

The collection of the 100,000 florins was entrusted on March 1, 1368, to Sir Thomas Dale and Walter de Barde(s)—one of the Bardi, bankers of Florence (Rymer, March 11, 1363)—master of the mint at Calais and the Tower of London. Kervyn (1. 161) says that Dale received the money between February (March?) and April, at Bruges, but gives no authority.

If a florin of Florence equaled three shillings English, 100,000 florins = £15,000 = approximately $1,125,000 (at the arbitrary rate of £1 = $75; cf. *Hist. Background*, p. 165). Of this sum nearly four-ninths (exactly nineteen-forty-fifths) seems to have been expended for Lionel’s journey to Italy (Devon, *Issues of the Exchequer*, March 5, 1369). Probably the journey cost much more, for we know of a single separate item of £178 13 4 = $13,400, merely for transporting Lionel’s 457 men and 1280 horses from Dover to Calais (Rymer, May 10, 1368). This sum is made up of £173 6 8 for 39 ships and 13 boats, besides £5 6 8 for the ‘pontage’ of the horses. The hire of the ships was at the rate of £3 13 4 each, and that of the boats £2 6 8 each.
Lionel's Journey to Italy

(1) To Violante, 100,000 gold florins[^13] [in addition to the dowry already paid].
(2) To her chamberlain, 1282 florins, for the furnishing of her house.
(3) To Lionel, 10,000 florins.
(4) To Lionel, as provision for himself and his company, 10,000 gold florins a month for June, July, August, [September],[^14] October, and half of November—(say) 55,000 florins.[^15]
(5) To Lionel, six pieces of cloth of gold made up into various garments—mantles, doublets, turche, and hoods—all thickly set with pearls; every one of these being carried away to England.
(6) For other expenses of Lionel and his company, 20,000 gold florins.

Here, then, we have a total of 186,252 florins (not to speak of the cloth of gold), or, let us say, $2,095,335, to add to the $1,125,000 mentioned above.

The ornaments provided for Violante were two crowns of gold, set with numerous sapphires, emeralds, balas rubies, and large pearls; eleven jewels, with pearls and other gems; thirty-five garments of various fashions, made of silk and gold, and embroidered with pearls and precious stones; a large number of collars and necklaces; innumerable ornaments for fastening the hair; together with 294 vessels of silver and gold of various shapes.

IV. LIONEL'S JOURNEY TO ITALY

1. DOVER TO PARIS

Lionel left England early in April,[^1] but we can not be sure of the exact day. Froissart[^2] informs us that Lionel spent Easter,

[^13]: Perhaps Corio and Jovius include this in their 200,000.
[^14]: Omitted, but almost certainly through inadvertence.
[^15]: The chronicler complains that, since Lionel died on Oct. 15 (wrong for 17), he had been overpaid by 10,000 florins.
[^1]: Walsingham (i. 306) merely says 'mense Aprilis.'
[^2]: Froissart's account of the whole journey is subjoined (from Kervyn 7. 246-7), with interpolations of the chief variants from his second redaction:

'En ce temps fu tretiés li mariaiges entre monseigneur Lion, duc de Clarense, fil au roy Édouwart d'Engleterre et à le royne, et la
April 9, at Abbeville. As Abbeville is about 60 miles in a straight line from Calais, where the expedition landed, and as 457 men and 1280 horses would have proceeded rather slowly, four days—April 5, 6, 7, and 8—are none too many to allow for this part of the journey, especially since the cavalcade only reached Paris, 87 miles in a direct line from Abbeville, in time for the next Sunday, April 16. If we assume that they covered

fille monseigneur Galéas, seigneur de Melans, qu'il avoit de madame Blanche, serour au conte Amé de Savoie, liqués mariaiges se parfist et conferma, et se parti messires Lions, dus de Clarens, d'Engleterre moul estoffémente et en grant arroy [accompagniés grandement de chevaliers et d'escliers d'Engleterre], à bien IIe chevaux. Si estoit ses compains en ce voiaige ungs grans bannérés d'Engleterre et riches homes durement, que on nommoit messire Édouwart le Despensier. Si tint li dessus dis dus ses Pasques en le bonne ville d'Abbeville, qui estoit au roy son père, et puis s'en parti et chevaucha tant par ses journées qu'il vint à Paris, où li roys Charles de Franche estoit, et li dus de Berri, li dus de Bourgoingne, si frère, li dus Locis de Bourbon [et li sires de Couci] et li contes de Savoie ossi, et rechurent le dit monseigneur Lion et festyérent grandement, et li donna li roys Carles de Franche grans dous et biaux jeuxiaux et à tous ses chevaliers ossi. Puis s'en partirent et chevauchéirent parmy Bourgoingne, et puis entrèrent en le conté de Savoie. Si rechupt li dis contes à Chambéry monseigneur Lion d'Engleterre et ses gens moulent grandement, et les festia et honnoura durement, ensi que bien le savoit faire, puis s'en partirent [et passa li dessus dis dus parmi le royauame de France et vint en Savoie, où li gentils contes de Savoie le rechut très-honnerablement en Chambéri, et fu là II jours en très-grans reviaus de danses, de caroles et de tous esbatemens. Au tierc jour, il parti] et passèrent outre en Lombardie, et estoient de bonne ville en bonne ville trop grandement festyet et honnouret. Si acompaignoit le dit monseigneur Lion li gentils contes de Savoie, et l'amena à Melans. Là fu-il grandement festyés de monseigneur Galéas et de monseigneur Bernabo. Si espousa la ditte dame le lundi après le jour de le Trinité, l'an de grâce mil CCC et LXVIII, en le bonne cité de Melans.

3 Abbeville at this time belonged to England. A year later (April 29, 1369), it was captured by the French (Kervyn 7. 309-12, 537; cf. 17. 459).
4 These particulars in Rymer, under date of May 10; cf. above, p. 29, note 12.
5 A couple of thousand, according to Froissart (see above, note 2).
6 As they very likely would not have traveled on Good Friday, April 7, another day may well have been required.
87 miles in six days—Monday to Saturday—this would be at the rate of 14½ miles a day, which corresponds pretty nearly to what we have assumed for the journey, Calais to Abbeville. Now the ferriage across from Dover to Calais would have required a day, April 4. At the rate of 14½ miles, it would require a day from Canterbury to Dover, and four more for a leisurely progress from London to Canterbury. On the basis of this calculation, the array may have left London early on Wednesday, March 29, arrived at Canterbury on Palm Sunday, April 2, and thus reached Dover on April 3. If, however, they made a leisurely and showy progress from London, they may easily have consumed more time on the road, and thus have made an earlier start, perhaps as early as Monday, March 27.

At Paris, or rather St. Denis, Lionel was met by the brothers of King Charles V (1337-1380), the Dukes of Berry (1340-1416) and Burgundy (1342-1404); the king’s brother-in-law,

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8 Froissart says: ‘chevaucha tant par ses journées.’ Albert von Stade (13th century) reckons five days from Abbeville to Paris (Jahrbuch für Schweiz. Gesch. 4. 284-6).

9 See Hist. Background, p. 166, note 3.

10 There at least by the two brothers of the king (Grandes Chroniques, as above).

11 John, Duke of Berry, was hostage in England 1360-66; in 1396 he negotiated a truce with Richard II, and arranged for the latter’s marriage with Isabella, his niece, then only a child of six; when the future Henry IV was banished in 1398, a match was considered between him and Berry’s daughter, and Berry was deep in his counsels respecting his return to England (Dict. Nat. Biog. 26. 34). At his death he left vast treasures of jewelry, objects of art, and especially illuminated MSS., many of which have been preserved, one of the finest being his Livre d’Heures (Encyc. Brit., 11th ed., 3. 809). At the time of Lionel’s visit, he was on leave from Edward III to June 24 of that year (Kervyn 7. 517). Cf. Froissart, Dit dou Florin 317-330.

12 Philip the Bold, Duke of Burgundy, had distinguished himself at Poitiers (1356); on the defeat of his father, King John, he accompanied him (1357) into captivity in England, where he mostly remained till his release in 1360. After the death of Charles V in 1380, Philip for a time occupied the most powerful position in France. A contemporary described him as kindly and amiable to men of every degree, liberal and magnificent. His splendid tomb is in the museum of Dijon (Encyc. Brit., 11th ed., 24. 493). Cf. Froissart, Dit dou Florin 317-330.
Louis de Bourbon\(^{13}\) (1337-1410); Enguerrand,\(^{14}\) Lord of Coucy (1338-1397), brother-in-law of Lionel, and Count Amedeo VI\(^{15}\)

\(^{13}\) Bourbon was a hostage in England 1360-66 (Kervyn 7. 517-8). Though, on the death of Charles V, he, with the Dukes of Anjou, Berry, and Burgundy, assumed the guardianship of Charles VI, he had never had the opportunity to play a part befitting his high birth (Le Roulx, p. 170), until, in 1390, he assumed command of the expedition directed against Mehediah, in northern Africa (see the account in Le Roulx, pp. 166-200; cf. Hist. Background, p. 200, notes 5 and 6). See Froissart, Buisson de Jouve 291-3.

\(^{14}\) Sometimes known as Ingelram de Coucy. The pride of his house appears in the well-known lines:

Je ne suis roi, ni prince aussi;
Je suis le seigneur de Coucy.

He was related to the Green Count by their common descent from Amedeo V of Savoy (d. 1323), of whom Coucy was the great-grandson, and Amedeo VI the grandson. He was married to Isabella (1332-1379), eldest daughter of Edward III, in 1365, she being six years older than her husband; in the same year he received the Order of the Garter. ‘On the eve of the renewal of the war between England and France in 1368, Enguerrand, unwilling either to break with his father-in-law or to fight against his lord the French king, went to Italy, and served in the wars of Urban V and Gregory XI against the Visconti’ (Dict. Nat. Biog. 29. 68; cf. Muratori 8. 361; R. I. S. 15. 497; 16. 518; Giulini 5. 559, 560), remaining there till about 1374 (see also Beltz, Memorials of the Order of the Garter, pp. 149-153; Kervyn 7. 419-420). Cf. Kervyn 14. 3, 4; Froissart, Dit dou Florin 442-4; Buisson 278-281; Le Roulx, Index; Mém. de l’Acad. des Insr. 25. 168-186.

\(^{15}\) Symonds (Age of the Despot, chap. 2) says that the rulers of Savoy and Montferrat are in the highest class of despots, and Gabotto (Atti della Reale Accademia delle Scienze di Torino 34. 215) calls Amedeo ‘that giant among the sovereigns of Savoy’ (from which, of course, the reigning house of Italy is descended). Referring to his exploits in the East in 1366 (see below), Gregorovius (Gesch. der Stadt Athen. 2. 163) speaks of ‘how much a heroic man could accomplish, even with meagre forces.’ For the romantic story of the origin of his name (the Green Count) in 1348, see Cordey, pp. 100-101, and M. H. P. 3 (Script. 1). 275-8. (For a Spanish green knight at the siege of Tyre by Saladin in 1187, see Chronique d’Ernoul et de Bernard le Trésorier, ed. Mas Latrie, pp. 237-8, 251-2; Röhricht, Gesch. des Könighreicb Jersalem, p. 468; for seven green knights who tourned in 1305 on the site of the Isthmian games, see Miller, p. 203; Rodd 2. 54; Chronique de Morée, ed. Longnon, p. 397; in Malory there is a green knight, Sir Pertilope, besides a black (see also Chrétien de Troyes, Cligès), a red, and a blue knight; Tristram is a green knight in Tennyson’s Last Tournament 169-170). For the
of Savoy (1334-1383), the uncle of Lionel’s betrothed, and the one who had perhaps been chiefly instrumental in arranging the marriage. Lionel was provided with a richly adorned apartment at the Louvre, where the king was in residence. On Sunday he dined and supped there; on Monday he dined with

account of his heroic expedition to free his cousin, John Palaeologus, Emperor of Constantinople, in 1366, see Kervyn 11. 233-4; M. H. P. 3 (Script. 1). 300-370; Datta, La Spedizione in Oriente di Amedeo VI (Turin, 1836); Le Rouix, pp. 141-158; Hertzberg, Gesch. Griechenlands 2. 300, 320, 322: C. Hopf, Griechenland im Mittelalter und in der Neuzeit, in Ersch und Gruber’s Allgemeine Enzyklopädie (Leipzig, 1868). Part 86. pp. 14-15 (it is interesting that in Mantua, on his return from the East, he had with him, according to Datta, three falcons and a small lion; cf. Hist. Background, pp. 171, 174). His itineraries on his return are given by Datta (pp. 162-3, 170-171), who notes that he reached Pavia Nov. 14. and Chambéry Dec. 10.

For Amedeo in general, see Froissart, Dit dou Florin 330-339, and cf. pp. 23-5, 36, 49, 59, 85, 99, 100, 102, 107.

16 So Cordey, p. 183: ‘Ils [Violante’s father and mother] s’adressèrent sans doute au Conte de Savoie. . . . Il fut assez heureux pour décider Édouard III à marier son fils Lionel, duc de Clarence, avec la princesse milanaise.’ On Nov. 22, 1366, Galeazzo had transferred to Amedeo three towns—a fact which Cordey regards as significant in this connection.

Amedeo came to Paris to meet Lionel, but this was not his sole motive. We find that on the very day of Lionel’s arrival, Amedeo received the promise of 50,000 gold florins from the king by way of indemnity for the war of Faucigny in 1355; and we have even a list of his expenditures for a variety of costly articles, among the rest for a hat adorned with a ruby and large pearls, destined for the king, which cost 1000 florins (Cordey, pp. 184-5). At Paris he met Guillaume de Machaut, then 70 years old, who presented him with a romance (perhaps his Livre du Voir Dit, composed a few years earlier), and received by way of gratuity the by no means inconsiderable sum of 300 golden francs (Cordey, p. 185).


17 Hare, Walks in Paris, pp. 36-37: ‘On the site of a hunting lodge, . . . Philippe Auguste in 1200 erected a fortress, to which St. Louis added a great hall, which was called by his name. The fortress was used as a state prison, and its position was at first outside the city,
the queen\textsuperscript{13} at the king's hostel near St. Pol,\textsuperscript{19} where she was staying, \textquoteleft et y fist l'en très grant feste.' After dinner, when

in which it was enclosed in 1367. . . . The Louvre was greatly enlarged by Charles V, who added many towers, and surrounded it with a moat which was supplied from the Seine. He made the palace into a complete rectangle, always preserving the great central dungeon tower. In spite, however, of his additions, space was wanting in the labyrinthine apartments of the Louvre for his splendid receptions, . . . so he only

\begin{center}
\textbf{Jeanne de Bourbon, Wife of Charles V.}
\end{center}

\textit{(From Racinet, \textit{Le Costume Historique}, Vol. 4.)}

inhabited the fortress for a short time, and devoted himself principally to building the Hôtel St. Paul.'

\textsuperscript{13} Whom Delachenal (1. 44) calls one of the most gracious figures of the 14th century. As to her picture, her cote-hardie has the color and the arms of France; only on ceremonial occasions was it cut so low in the neck. The crown is of gold, set with precious stones. See also p. 50.

\textsuperscript{19} Cf. Hare, \textit{Walks in Paris}, pp. 201-2: 'Every preceding king had held his Court either in the Cité or at the Louvre, but Charles now bought, near the Port de St. Paul, the hotel of the Conte d'Étampes. . . . In 1363 he added to his purchase the hotel of the Archbishop of Sens, with gardens which reached to the Port. . . . By an edict of July, 1364, Charles V, after coming to the throne, declared the Hôtel de St. Paul
they had danced and played—the king's brothers being always

to be for ever part of the domain of the Crown—the hotel where "he had enjoyed many pleasures, endured and recovered from many illnesses, and which, therefore, he regarded with singular pleasure and affection." No plan of the Hôtel de St. Paul has come down to us, but we know that it was rather a group of palaces than a single building, the Hôtel de Sens being the royal dwelling-place, . . . the Hôtel d'Étampes being called Hôtel de la Reine. . . . The palace as a whole was surrounded by high walls, inclosing six meadows, eight gardens, twelve galleries, and a number of courts. . . . The garden walks were shaded by trellises covered with vines. . . . In their shade Charles V amused himself by keeping a menagerie, and many accounts exist of sums disbursed to those who brought him rare animals. Here the queen and her ladies appeared in the new dress of the time, in which their own arms were always embroidered on one side of their gown, and their husbands' on the other." Cf. Michelet 5. 43-4. From this residence Charles could see, two years later, the flames of the villages which the English were burning (Michelet 5. 31; Lavisse 4. 235).

Add Encyc. Brit., 9th ed., 18. 189: 'He [Charles V] robbed the Louvre to some extent of its military equipment, in order to make a convenient and sumptuous residence; his open-work staircases and his galleries are mentioned in terms of the highest praise by writers of the time. This did not, however, remain always his favorite palace; having built or rebuilt in the St. Antoine quarter the mansion of St. Paul or St. Pol, he was particularly fond of living in it during the latter part of his life, and it was there that he died in 1380.'

These reunions must have had much the air of a family party. There were present Lionel's brother-in-law and his prospective uncle. Then, since the king's sister, Isabella, had been married, eight years before—she was now only 19 years old—to Gian Galeazzo (a marriage probably negotiated by Amedeo; cf. Cordey, p. 155), the brother of Lionel's betrothed, that would make her sister-in-law to Lionel, and thus tend to create a fraternal feeling with Berry, Burgundy, and the king, and more remotely, through the king, with the queen and her brother, Bourbon. Moreover, since Amedeo had married Bonne de Bourbon in 1355 at the Hôtel St. Pol, he was at table with his sister-in-law, the queen (once almost betrothed to him; Delachenal 1. 26-27), and his brother-in-law, Louis de Bourbon, by whom the Green Count's wife was much beloved (Kervyn 1. 163, note).

These ties would be strengthened by the residence of Berry, Burgundy, and Bourbon in England, where, though they were detained as hostages, they can have known little of the horrors of imprisonment. The father of the three royal brothers, King John (1319-1364), after his defeat at Poitiers, was in England as a captive for three years (1357-60), yet, after more than three years of liberty, while his ransom was still unpaid,
Bonne de Bourbon, wife of Amedeo VI of Savoy.
(From Cordey, frontispiece.)
in his company—they retired, and afterwards supped with the

he voluntarily returned to England (January, 1364) in the spirit indicated by the following quotations from Froissart (Kervyn 6, 387, 389, 390, 392, 393; second redaction in square brackets):

‘Li roys Jehans avoit proupos et affection d'aller en Engleterre veoir le roy englies, son frère, et madame le royne, sa soer (enssi s'appelloient-il par le tretiet de le pès), et ordonnoit toutes ses pourvëances et ses besoingnes à Bouloigne. Si le conseilloyent bien li aucun de Franche qu'il ne volsist mies aller, et que c'estoit ungs grans përius sus le veu et prommesse qu'il avoit fait, et que on le poroit là détien pour le somme de se redention qui estoit encore à payer; mès li roys Jehans respondoit qu'il avoit trouvet ou roy d'Engleterre, en madame le royne, en tous leurs enfans et ens ès barons d'Engleterre tant d'onneur, d'amour, de courtosisie et de loyaulté, qu'il ne s'en doubtoit en riens et qu'il ne cesseroit jammas, si y avoit esté et yaus veus, et ossi ses amis qui là estoient hostagiers pour lui. . . .

Quant il fu venus à Eltem [Eltham], en l'ostel dou roy englies, il y fu recups à grant joie, che puet-on moult bien croire, et tout chil qui avoecq lui estoient, pour l'amour de lui. Là eult grans festes, grans sollas, grans esbatennens, belles danses et belles carolles de seigneur, de dame et de damoiselle [et là estoit li jones sires de Couci qui s'efforçoit de bien danser et de canter quant son tour venoit], et s'efforchoit chacuns de festyer et de juer pour le cause dou roy de Franche. Quant il eut là estet, je croy II jours, il s'en parti et vint à Londres, où il fu requeilliès moult honnorablement et menés et aconvoyés de ses cousins les enfans dou roy englies, jusques à l'ostel de Savoie qui estoit ordonnet pour lui, qui siet sus le Tamise au dehors de Londres. Là le laissièrent-il, et là se tint li roys Jehans et tout son hostel. Si avoir dalléès lui chiaux de son sanch, le duch de Berri, son fil, le ducq d'Orlyens, son frère, le conte d'Allenchon, Robert d'Alençon et Gui de Blois, ses cousins, qui adont estoient jone damoisel, ossi le ducq de Bourbon et le conte de Saint-Pol et les seigneurs qu'il avoit là amenés de Franche. Si tenoit là li dis roys et tint là l'ivier grant estat et grant hostel, et estoit souvent visétes dou roy englies et de ses enfans [et le visetoient souvent li rois d'Engleterre et si enfant li dus de Clarense, li dus de Lancaster et messiresses Aymons]. Si donnoient chil roy grans disners et grans soupers li uns à l'autre, et jeuioient et esbatoient ensemble et parlioient et consilloient de leurs besoingnes. . . . Enssi passoient li roy le temps, et veoiens souvent l'un l'autre, et donnoient et envoiens li uns à l'autre grans dons, biaux jemiaux et riches présens pour nourir entr'iaux plus grant amour.'

Here it is explicitly related that he was often visited by Lionel (named first), John of Gaunt, and Edmund.
king. On Tuesday, the two dukes entertained him and his knights at dinner and supper at the Hôtel d’Artois. Among those present at the banquet, besides the nobles mentioned above, the Counts of Armagnac, Eu, and Étampes, Robert d’Alençon, Constable of France, the Archbishop of Sens, and the Bishop of Nevers. That night he slept at the Louvre, and on Wednesday dined and supped again with the king, who bestowed upon

In Lionel’s visits to King John, with whom were the Dukes of Berry and Bourbon, the Counts of Eu and Tancarville (see Kervyn 6. 388), and Robert d’Alençon (the last three mentioned below), there would have been only a renewal of the graceful courtesy he, in conjunction with two of his brothers, had shown the king in 1360, on his release at Calais. King John’s first act then was one of devotion. Grateful for his delivery, he decided to perform a pilgrimage, barefoot, to the shrine of Notre Dame at Boulogne (where the future Charles V offered, July 2, 1362, five candles, each weighing 32 pounds; Delachenal 2. 312; cf. Michelet 5. 28, twenty miles distant. Immediately Lionel, then 21 years of age, the Black Prince (30), and Edward III’s fifth son, Edmund (19), offered themselves as his companions. They started on the morning of Oct. 27 (Coville, in Lavisse 4. 156, says that King John left Calais on Sunday, Oct. 25), and, all barefoot alike, walked the distance so briskly that they were at Boulogne before dinner. The religious ceremony over, they abandoned themselves to merry-making. The next morning early the three princes returned to Calais, where their father was awaiting them, and whence they sailed for Dover on Oct. 31 (Kervyn 6. 320-1).

Another bond uniting these table-mates was their youth. The eldest, the Green Count, Lionel’s future uncle by marriage, was only four years older than Lionel; the king and Bourbon were a year older; the queen and Coucy of the same age; Berry, two years younger; and Burgundy, four years younger. Thus everything must have favored a joyous abandonment to the pleasure of the moment. Yet Michelet (5. 22-23) points out that at this moment the English companies of adventure were ravaging Champagne, and from there to the very suburbs of Paris. Elsewhere (5. 34, 35) Michelet speaks of the egregious pride and ambition of the English.

20 Grandes Chroniques, as above. For the festivities in France at this period, see De Noirmont (1. 93) : ‘Malgré les désastres de Crécy et de Poitiers, le règne des premiers Valois [1328-1380] fut l'apogée de la royauté féodale. Leur cour était une fête éternelle, une brillante imitation de la Table ronde du roi Arthus. Dans les intervalles des grandes guerres, banquets, tournois, et chasses splendides s’y succédaient sans interruption.’


22 Cordey, p. 184.
him and his companions gifts to the value of more than 20,000 florins.

2. PARIS TO CHAMBÉRY

On Thursday Lionel left Paris, accompanied by Jean de Melun, Count of Tancarville (d. 1382), as far as Sens, some 60 miles distant; from this point other knights attended him to the boundary of France, probably Châlon-sur-Saône.

Froissart seems to say, in his first redaction, that the Green Count accompanied Lionel from Paris to Milan. This, however, would be an error. Amedeo preceded Lionel, probably by only a single day, taking the route by which he had come, and which Lionel no doubt followed—by Villeneuve-sur-Yonne, Auxerre, and Châlon-sur-Saône, where France bordered on Franche-Comté, to which point, about 180 miles from Paris, a herald of the king accompanied him.

Lionel followed, as we have seen, on April 20. He must have arrived at Chambéry, about 290 miles from Paris, either May 11 or 12. On his route, after Mâcon and Pont-de-Veyle, lay Bourg-en-Bresse (made famous by Matthew Arnold's *Church of Bront*), where he may have arrived on May 8. Here he was doubtless feasted for a day or more, after which he proceeded by way of St. Rambert and Belley to Chambéry (about 30 miles from Bourg). Messengers had been sent out in various direc-

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*Grandes Chroniques*, p. 252.

*Reckoning the florin at 3 shillings, this amount equals £3000, which, somewhat arbitrarily reckoned on the basis of £1 = $75 (see *Hist. Background*, p. 166), = $225,000.*

*A famous hunter, brother of the Archbishop of Sens (Delachenal 2. 84), grand master of the royal household, and of the woods and waters of France.*

*Grandes Chroniques*, p. 252.

*See p. 31.*

*Messengers had been awaiting his arrival at Mâcon for some time in April, and several days in May.*

*On that date payment was made to several workmen who had been making preparations for Lionel's reception in that town.*

*Isabella of France, traveling southwards in September, 1359, spends two days at Pont-de-Veyle (Sept. 6-8), reaches Bourg on the 8th, and Belley on the 10th, whence she was conducted by way of Hautecombe and Bourget to Chambéry (Gabotto, *Rendiconti della Reale Accademia dei Lincei* 5. 8. 85).*
tions to ascertain and report to Amedeo the arrival of Lionel at his various stopping-places, and no doubt also to invite the nobility of Savoy to the festivities at Court. There must have been brilliant receptions of Lionel at various towns through which he passed, but of these we know nothing in detail. It is certain, however, that all these were surpassed by the gayety and splendor at Chambéry, which, according to Froissart, lasted two days. He it was who, as a spectator and participant, not only characterized these 'revelries of dance, roundelay, and all manner of game' in his prose, but has left us a detailed account of them in his Prison Amoureuse. There were present a hun-

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31 Cordey, p. 186.  
32 Froissart, above, p. 31.  
33 Above, p. 31. If Lionel arrived at Chambéry on Friday, May 12, then the feasting must have occupied Saturday and Sunday, the 13th and 14th, leaving him free to depart on Monday, the 15th. But as Froissart elsewhere says (Prison Amoureuse 384) three days, this is perhaps quite as likely, in which case we may assume that the days so spent were Friday, Saturday, and Sunday, May 12-14. Holinshed (Chronicles, London, 1807-8, 2. 685-6), following, or mistranslating, a text of Froissart, even says, 'there he remained foure daies'; but this may be meant to include the day of arrival or departure, or both.  
34 See above, p. 31.  
35 I subjoin lines 354-423 (Poésies, ed. Schéler 1. 221-4), though only lines 364-411(?) refer to the festivities at Chambéry:

 Là estoient li menestrel,  
Qui s'aquitoient bien et bel  
A piper, et tout de nouvel,  
Bones danses teles qu'il sceurent.  
Et si trestost que cessé eurent  
Les estampies qu'il batoient,  
Chil et chelles qui s'esbatoient  
Au danser, sans gaires atendre,  
Commenchient leurs mains à tendre  
Pour caroler. Là me souvint  
D'un temps passé: já il avint  
En Savoie, en le court dou conte,  
De qui on doit bien faire compte,  
Car il est nobles et vaillans,  
D'onneur faire aiges et taillans,  
Celle grasse li portent tuit.  
L'an mil CCC sissante et uït  
Fu que passa parmi sa terre
dread and twenty beautiful young women, wives and daughters of knights, richly clothed. For the dances and carols Froissart himself supplied words. When the minstrels ceased, the ladies never stopped, but continued their roundelays hand in hand. Hardly had one lady finished a virelay than another began a new one, for new and good were many of these songs.

Li uns des enfans d'Engleterre,
Lions, fils Edouart le roi,
En très noble et poissant arroi;
Et li contes que j'ai nommé,
Qu'on claime ou qu'on clamoit Amé,
Honnourablement le rechut,
Là fu bien, qui l'estat·conchut,
Et l'ordance et le maniere
De la court qui fu moul pletiere,
Les disners, les belles assises,
Les tables ostées et mises,
Les vins, les viandes, les més.
Trois jours dura la feste; mès
Il y eut danses et carolles,
Pour quoi j'ai empris les parolles,
Car bien .VI.xx. jones et belles,
Toutes dames et damoiselles,
Filles de chevaliers ou fames,
Dou pays les plus frices dames,
Moulit ricement et bel arrées,
Trés noblement et bien parées
En draps de canjans et de soie,
Plus rices deviser n'osoie,
Drut perlées et orfrisies,
Dont le mieuls estoient prisies,
Y peuist on adont veoir.
Cure n'avoient de seoir,
Mès de danser à l'estrivée;
Toute joie y e rt arrivée,
Et quant li menestrel cessoient.
Les dames ne se lassoient,
Ains caroloient main à main
Tout le soir jusqu'à l'endemain.
Et quant chanté li une avoir
Un virelay, on ne savoit
Encores s'il avoit fin pris,
Quant uns aultres estoit repris
Ou de dame ou de damoiselle.
Mainte canchon bonne et nouvelle
3. CHAMBÉRY TO PAVIA

From Chambéry on, Lionel was accompanied by Amedeo of Savoy.\(^{36}\) They must have begun their journey on Monday, May 15, since we find them at Aiguebelle, 23 miles from Chambéry, on May 16.\(^{37}\)

On y chanta et respondi,
A celle fin je le vous di:
A la feste oï j'estoie,
Quant avoec celles m'espèretoie
Et chiauls de qui la compagnie
Estoit moult bien accompagnée,
L'une après l'autre sans detri
Chantoient si com par estri.
Là fu mon virelay cantés
Et moult volentiers escoutés,
Mès à paines peut il fin prendre,
Quant ma dame en volt un reprendre
Qu'ounques mès je n'avoie oï.

\(^{36}\) Kervyn, 7. 247; see above, p. 31.

\(^{37}\) Cordey, p. 187, note 1. Cordey says they went by the Mont Cenis, but strangely enough adds that they had a guide as far as Aosta, which, if true, would indicate that they crossed by the Little St. Bernard. That the passage was regularly made by the Mont Cenis is clear enough. Thus the French princess, Isabella, crossed by this route (Gabotto, *Rendiconti*, p. 87): Sept. 15, Montmélan and Aiguebelle; 16, Aiguebelle; 18, St. Michel; 19, Les Fourneaux; 20, Lanskebourg; 21, Susa, the distance from Chambéry to Susa being 83 miles. In 1359, the Green Count traveled as follows (Gabotto, p. 80): Sept. 11, Chambéry; 11, Montmélan; 13, Aiguebelle; 13-15, La Chambre, St. Michel, Les Fourneaux, Lanskebourg. In 1393, Henry, Earl of Derby, traveled in the opposite direction (*Derby Accounts*, ed. L. T. Smith, p. lxxvii): May 25, Susa; 26, Lanskebourg; 27, St. Michel; 29, Aiguebelle; 31, Chambéry. Ruskin walked from Susa to Lanskebourg, 23 miles, in one day, Sept. 1, 1858 (see Library Edition 35. 498); for his description of the scenery at Lanskebourg, June 2, 1841, see *op. cit.* 35. 296-7, cf. 1. xli; for his description of the country about Susa, 36. 231-2 (letter to Miss Siddal of Jan. 27, 1856). Summing up the foregoing itineraries, we have: Isabella's journey, Chambéry to Susa, 6 days, besides one day for rest, apparently; Amedeo's journey, Chambéry to Lanskebourg, 5 days, with one to spare for Susa; the Earl of Derby's, Susa to Chambéry, 7 days. We might therefore assume that Lionel would have been at St. Michel on May 18, at Lanskebourg May 21, and at Susa May 22, though it must always be remembered that his party was large, and that he might therefore have been delayed. However, May 22 is none too early, considering
Chambéry to Pavia

From Susa the English probably advanced by way of Vercelli and Novara to Pavia. Here they would have been entertained at the Castello, which had been begun by Galeazzo in 1360, and completed in 1367. The earliest historian of Milan calls this building "the first in the world," and Symonds declares that it was "the noblest dwelling-house in Europe." It is particularly interesting in its possible relation to Chaucer, who, if we may credit the statement of Gioffredo della Chiesa, writing between 1430 and 1440, may have seen painted on its walls the story of Griselda. For the tower of Boethius, see Magenta, opp. p.

that from Susa to Pavia, even by way of Turin, is not less than 120 miles, and that from Pavia to Milan is 20 miles more. Now we know that on Saturday, May 27, Lionel's train entered Milan.

Cordey (as above) assumes that the journey over the Mont Cenis occupied May 15 to 18. Gabotto, on the other hand, says explicitly (Misc. di Stor. Ital. 33. 168-9) that Lionel was at Susa on May 17, from which place Amedeo issued summons to the communes of Savoy and Achaia (here meaning Piedmont) to send representatives to Rivoli with reference to a reform of the country. Cordey (1911) writes later than Gabotto (1895), and then Gabotto is sometimes inaccurate: thus he assigns April 6, instead of 16, for Lionel's arrival at Paris.

At least this was the route pursued by Isabella (see p. 42) in 1360 under the same guidance (R. I. S. 16. 405); the Bishop of Novara may also have joined them at that city (see p. 59). Vercelli and Novara were among the cities inherited by Galeazzo in 1354 (R. I. S. 16. 337).

So Chron. Plac.

Age of the Despots, chap. 2. The hand of man has since dealt harshly with it; see Murray, Handbook for Travellers in Northern Italy, 3d ed., 1847, pp. 206-7. For a remarkable duel which took place in its courtyard on June 24, 1399, see Magenta 1. 242-5.

See the delineations of it in Magenta, opp. p. 74; for its magnificent park, several miles in circumference (cf. Hist. Background, p. 186, note), see Magenta, opp. p. 118; cf. Rosmini 2. 116.

M. H. P., p. 861: 'La historia de Griselidis, Marchexa de Salucio, ha [e] stata depinta ab antiquo nel Castello di Pavia, la quale era sedya regale di coloro.' Gioffredo's statements dispose of Westenholz's denial (Die Griselidis-Sage in der Literaturgeschichte, p. 4). The question arises, however, whether these walls were those of the new castle, or those of the older one built by Matteo I between 1315 and 1322 (R. I. S. 16. 379, 605). However, Chaucer may easily have seen both, for the old castle was left standing when the new one was built (R. I. S. 16. 379: 'Apud Castrum antiquum, erectum per quondam Dominum Mattheum, alius Castrum mirabile fecit de novo erigi'). Which castle we suppose
162. For other sights in Pavia, see pp. 80, 92. A plan of the city in 1590 is in Magenta, opp. p. 1.

4. PAVIA TO MILAN

By the time Lionel left Pavia for Milan, his retinue would doubtless be composed, in addition to the 457 men with whom Gioffredo to have meant depends upon the interpretation we assign to the words 'ab antiquo.' If he wrote in 1437 (say), might he have regarded a period two generations earlier, in 1366, as ancient, or must we assume that he would have reserved this designation for a date (say 1316) 50 years earlier? That the story of Griselda did not gain its earliest currency from the classic form into which it was cast by Boccaccio and Petrarch is suggested by Gioffredo's statement that he himself was acquainted with it in three languages—Latin, Italian, and French (op. cit., p. 861: 'La quale se trova in historia, et in Latino et in Francosco e Italiano, che noi medemy habiamo veduta in questy tre idioma'). It is of course possible that he is here referring to Boccaccio's narrative, Petrarch's version, and a French translation (perhaps that of 1414). Against this hypothesis it may be urged that, since he is arguing for the Germanic origin of such names as Walter and Griselda, and therefore stressing the notion of antiquity (ib.: 'Et credemo che ly marchexi di Salucio che erano in anty fusseno ancora discesi da quely Saxony et Longobardy. Et molte cosse presumere me lo fano: prima, questy nomy come Manifredo, Adalayda, Valterio, Griseldis, e simily nomy che tirano sopra quely nomy di coloro, e sono inusitati'), he is not likely to have appealed to a version as modern as Petrarch's in support of such a theory. That there were earlier accounts than Boccaccio's is clear from the fact that Petrarch testifies (Sen. 17. 3) that he had often heard the story long before 1373, and that one of his reasons for translating Boccaccio's account was to render it accessible to people who knew no Italian ('Cogitatio supervenit, fieri posse ut nostri etiam sermonis ignaros tam dulcis historia delectaret, cum et mihi semper ante multos annos audita placuiisset, et tibi usque adeo placuisses perpenderem, ut vulgari eam stilo tuo censeris non indignam'), the context making it perfectly evident that he is referring, not to Boccaccio's literary reproduction, but to a popular tale, such as might be related by minstrels.

There always remains the possibility that Galeazzo, after Petrarch had written his Latin version by June 8, 1373, and before his own death in 1378, had these frescoes executed, out of regard for Petrarch's memory. There is nothing in the relations between the ruling house of Saluzzo and the Visconti to discredit such a supposition, seeing that in April, 1365, Federigo II, Marquis of Saluzzo (d. 1369), acknowledged that he held his marquisate of Bernabò (M. H. P., pp. 1010-11), and that ten years later he looked to Galeazzo and Bernabò for defense against his
he started from Dover, of a comparatively few persons who had gone to Italy on his business in the months immediately preceding and in large measure of detachments from the bands of Englishmen then serving as mercenaries in Italy. One proof of the latter is that so many of his followers were armed with great bows and shields, which is somewhat easier to understand of the local forces than of those which had come with him from England; another is that Cron. Monf. (p. 1212) speaks of the English in Lionel's train (presumably such mercenaries) as having greatly prevailed against the resistance of the Emperor Charles, and as having done infinite damage in the lands of the state of Milan.

enemies (M. H. P., p. 1023). But if the frescoes were executed after 1373, out of regard for Petrarch, would Gioffredo be likely to characterize them as ancient, and seem to know nothing of the story as told by Petrarch after Boccaccio?

It therefore appears (1) that if Gioffredo's 'ab antiquo' means any time between 1316 and 1367, Chaucer—supposing him to have been in Pavia—might have seen the frescoes; (2) if Gioffredo's 'ab antiquo' refers to a date after 1367 (or the earlier months of 1368), Chaucer might have seen the frescoes if he visited Pavia during his mission to Lombardy in 1378, or if perchance he made the two days' trip (Petrarch, Sen. 5. 1) from Genoa to Pavia in 1372-3. If in 1378, and the execution of the frescoes was due to the authority of Petrarch's version—for Boccaccio's direct influence need not be considered—Chaucer would undoubtedly have learned of Petrarch's agency in the matter, and would thus have been led to the latter's version, a copy of which, considering Galeazzo's relations with him, would surely have been in existence at Pavia.

44 See p. 31.
46 On these bows, see R. J. S. 16. 380.
47 Annal. Med.: 'inter quos erant multi cum arcubus et targhettis'; Frag.: 'molti con gli archi grandi in forma d'una terretta' (sic); Corio: 'tra i quali molti haveano archi.' These archers, like the others, must have been on horseback, if we are to take literally Corio's 'dismontarono nella corte.'
48 Temple-Leader and Marcotti (Sir John Hawkwood) assign this to the month of May. They say (pp. 61-2):

'This prince had erected a new bastion at Borgoforte on the Po, and stationed an Italian garrison there, which by reason of old rancors had disagreed with the German mercenaries in Visconti's pay, and was reduced to evil case, so that Bernabò had to ride in great
On May 27, the stately little army swept up from Pavia to Milan, about twenty miles, probably by way of Binasco. Some notion of the low meadows through which they passed may be

haste to the place, where—order being restored—he placed the bastion under the charge of Hawkwood's Englishmen. Then the Emperor Charles IV came down from the Alps, and made common cause with the d'Estes and other Italian princes against the Visconti, persuading them to attack Borgoforte. It must be noted that what between the Imperials (Bohemians, Scavonians, Poles, Grisons, and Swiss), d'Este's Italians, those of Malatesta, and of Queen Joanna; and the Church party, which consisted of Bretons, Gascons, and Provençals; as many as twenty thousand combatants presented themselves before that fortress. In the army of Visconti were Germans, English, Italians, Burgundians, all with the firm determination to defend the bulwarks; in those days a small place, well provisioned and manned with a spirited garrison, might defy even "an army sufficient to subjugate Italy." To intercept succor, the d'Este party had launched on the Po a fleet of galleys and other boats, and the river being much swollen by the melting of the snows, the Imperialists betought themselves of breaking the banks above Borgoforte; but the garrison knew how to save itself from the inundation, and returned it by breaking the banks towards the valley by night, thus flooding the plains of Mantua and the entrenchments of the Imperial camp. Charles IV was obliged to raise his camp, and shut himself up in Mantua; after which, on account of the damage he had suffered, and of the scarcity of provisions, he hastened to agree to Bernabo's terms.'

This seems to be a reminiscence of an earlier condition of things. In a sketch of the earlier operations of the English adventurers—the White Company and others—Temple-Leader and Marcotti (ib., pp. 12, 14, 15, 16, 17) say:

'Here then we behold the great English band marching towards the sea; attempting in vain to take Marseilles, they set fire to her suburbs, and pass by the Riviera to Nice; cross the Maritime Alps by the feudal estates of Malaspina, favored by Simon Boccanegra, doge of Genoa, and enemy to the Visconti; and thus descend into the valley of the Po. . . . The fact remains that Piedmont was devastated by the Hungarians, the Germans, and lastly by the newly arrived English. . . . The "Chronique de Savoie" says coldly, almost excusing them, that, being many, they could not live in Piedmont without spoiling the country, so that Conte Verde, who had imprudently counselled the Marquis of Montferrat to employ the English, repented, and took arms to defend himself. . . . By forfeiting the sum of 180,000 florins, Conte Verde obtained the restitution of his lands, and the English passed on to fight the
gathered from the following description of the route (reversed) which travelers followed in the first half of the nineteenth cen-

Milanese under the Marquis of Montferrat, making their headquarters at Sicciano near Novara. . . . Conte Verde proposed an alliance with Galeazzo Visconti, with the object of driving out the English from their states, and dividing Montferrat between them, but it must be admitted that the undertaking to rout the English seemed very difficult to Visconti, for he was at the same time attempting to make a treaty of peace with them. Albert Sterz feigned to consent, by which means the English succeeded in making a fierce incursion, passing the Ticino, and pushing on to within six miles of Milan. It was night, and people in the castles and villages were keeping the New Year's festivities, while the Milanese nobles were having a merry time, playing at tabulas et scacos (draughts and chess) unsuspecting and undefended, so that they were unable to prevent the robbers from taking anything and everything they chose. . . . They made prisoners of over 600 nobles, and would have taken more if ropes and time had not failed them. Some of the gang dragged behind them as many as ten nobles, together with their cattle; they could not save them all, because they were attacked by Visconti's boats in recrossing the Ticino, but it is said that with the money paid for ransoms, they pocketed about 100,000 florins.'

Among those in attendance on Lionel was very probably the famous condottiere, John Hawkwood, of whom Temple-Leader and Marcotti write (p. 60):

'In 1368 he had returned to the pay of Bernabò Visconti, together with William Boson [Bosson, R. I. S. 23. 555], conducting four thousand Englishmen. His passage into Lombardy was probably connected with the arrival there of Lionel, Duke of Clarence, son of Edward III of England, who came to celebrate his marriage with Violante, daughter of Galeazzo Visconti and niece of Bernabò*; and it is very likely that he went to pay homage at the court of his own Royal Prince, for we already know that all the English adventurers in Italy stipulated a clause in all their contracts affirming their loyalty to the King of England.'

The Dict. Nat. Biog. (25. 237) speaks of Hawkwood as drawn to Milan by the marriage, and adds: 'Shortly after the ceremony he, with four thousand men, entered the service of Bernabò Visconti.' The Milanese annalist says (p. 741) that this was in August. We know that Bernabò, as soon as Lionel's wedding was over, took some of the latter's men, *The Milanese annals say in general terms that Lionel was accompanied by about 2000 English, amongst whom were many archers. Giovio and Litta positively affirm that Hawkwood was in the Duke's party, and the heraldic book of Samson Lennard, Bluemantle, confirms the fact.

Quitting Milan by the Porta Ticinese, the road enters what may be termed the most Flemish portion of the plain of Lombardy. Meadows, rich in clover, yield two or three crops a year; thick rows of sallows and poplars bespeak the humidity of the soil, luxuriant even to rankness. On either side are frequent transverse or longitudinal cuts and canals. Of these the largest is the Naviglio^{51} di Pavia, completed by the French, which joins the Ticino at Pavia. The road skirts this canal all the way.

As the festal company approached Milan, there issued from the Ticinese Gate a gorgeous procession to meet them.^^ This procession was headed by Galeazzo.^^ First came Bianca,^^

and returned to Guastalla, and thence went by boats to Borgoforte, which he captured and destroyed (Corio, p. 471). Borgoforte is on the northern shore of the Po, 7 miles south of Mantua; Guastalla on the southern bank of the Po, midway by rail between Mantua and Parma, and a dozen miles from Borgoforte.

^{50} So *Annal. Med.; Frag.* Corio says May 17 (XVII for XXVII), but provides the means of correction by adding that it was the vigil of Pentecost.

^{51} Cf. p. 11.

^{52} *Annal. Med.; Corio; Frag.*

According to Magenta (i. 156), following Jovius, Galeazzo was strong and handsome, tall, with fair and curling locks, friendly but keen looks, a white and delicate skin, and lofty bearing. Symonds says (*Age of the Despots*, chap. 2): ‘Galeazzo was distinguished as the handsomest man of his age. He was tall and graceful, with golden hair, which he wore in long plaits, or tied up in a net, or else loose and crowned with flowers.’ See his portrait on p. 17. For his character, cf. p. 16.

^{53} Bianca (1336-1387), now 32 years old, was herself the daughter of a Violante (second child of Theodore Paleologus, Marquis of Montferrat), married to Aimon of Savoy (*Arch. Stor. Lombardo* 34. 6). Beautiful at the time of her marriage in 1350 (*M. H. P.*, p. 1180; Corio, p. 438), Bianca’s character remained beautiful till her death. Magenta (i. 178-9) speaks of her ready intellect and unspeakable goodness of heart. Amid agitating vicissitudes, in victory and defeat, through all the excesses and crimes perpetrated by her husband and her son, she remained meek and untroubled, an exemplary wife and mother. Her native sweetness led her to innumerable works of charity, and, as far as in her lay, she mitigated the sufferings which Galeazzo inflicted (cf. *R. I. S.* 16. 550). Notwithstanding, Bernabò sent one of his creatures from Milan to Pavia to assassinate her when she should be walking in the park accompanied by none but her ladies, merely because she had tried to reconcile her brother with her husband (*R. I. S.* 16. 797). When the assassin returned
sister of the Green Count, and wife of Galeazzo; Isabella\textsuperscript{55} of France, wife of Gian Galeazzo; and Ricciarda, wife of Andrea de' Pepoli.\textsuperscript{56} These, and 80 ladies beside, were all dressed alike in cote-hardies\textsuperscript{57} of scarlet,\textsuperscript{58} with sleeves of white cloth\textsuperscript{59} embroidered in trefoil-designs, and with gilded belts about their loins of the value of 80 golden florins. Next followed, under without having accomplished his purpose, Bernabò promptly had him hanged.

\textsuperscript{55}Isabella was 19 years of age, having been born on Oct. 1, 1348 (Delachenal 2. 233, note 5). She was just over 12 when she was married to Gian Galeazzo on Oct. 8, 1360. It was she of whom Matteo Villani said (R. I. S. 14. 617-8; cf. Delachenal 2. 232, note 1): 'Who could have dreamed, considering the greatness of the crown of France, and the insignificance of the King of England compared with him who wore it, that he would be reduced to sell, as it were, his own flesh at auction?' The marriage, like that of Violante, had been brought about by Amedeo (R. I. S. 16. 505-6; Delachenal 2. 235). Villani (R. I. S. 14. 608) thus speaks of her demeanor on that 8th of October: 'Her attire and bearing were royal as she received homage from the [two] lords and their ladies; but she would not endure the cloth upon her head, and thus she stood until she was wedded. Then, laying aside her royal dignity and her nobility of blood, she did reverence to Galeazzo, Bernabò, and their ladies.' She was not to live long: four years after Violante's wedding (September, 1372), she died in childbirth of her third son, Charles (Delachenal 2. 237). Her first child, a daughter, Valentina, was born in May, 1366 (Magenta i. 129). The Chronicle of Piacenza (R. I. S. 16. 512, and so 748) calls her a noble woman, good, wise, humble, God-fearing, and virtuous, the mother of several excellent children, and declares that when she died, her like was not left upon earth. See also p. 110.

\textsuperscript{56}See p. 27.

\textsuperscript{57}See the pictures of Jeanne and Bonne de Bourbon, on pp. 35, 36, and cf. Encyc. Brit., 11th ed., 7. 238. In the picture of Iseult (see p. 50), her gown is skyblue, edged with crimson bands at neck and elbow. The precious stones of her crown and pendant, and of the knight's garter, are probably rubies. Iseult's hair is golden. The knight's doublet is crimson.

\textsuperscript{58}It is uncertain whether 'scarlatta' here denotes a color or not; Frag. has 'cotardia di scarlatto, con maniche dentro di scarlata bianca.'

\textsuperscript{59}Such contrasting colors were also found in men's clothing at this period. Thus we are told (Encyc. Brit., as above): 'A gentleman would have his coat parted down the middle in red and white, with hose of white and red to match.' And in the first reference that we have to Chaucer, April 4, 1357 (Kirk, Life-Records of Chaucer IV, pp. xiv, 153), he is down for a pair of red and black [breeches, probably]. See especially Chaucer, Parson's Tale 422-7. For some centuries before Shakespeare's time, the robes of serjeants at law were parti-colored, the
the leadership of Gian Galeazzo, 30 knights and 30 squires, all dressed alike, and mounted on powerful tilting-steeds, with tilting-saddles. Then followed, mentioned by name, two of right-hand side one color, and the left another (Shakespeare's England, 1916. 1. 396-7). On the costume a little earlier, see Michelet 4. 226.

Iseult and a Knight of the Garter.
(From Racinet, Le Costume Historique, Vol. 4, reproducing an Italian manuscript of the 14th century.)

Gian Galeazzo was now 16 years old, having been born at Milan on Oct. 15, 1351 (Arch. Stor. Lombardo 16. 923-938; 34. 61 ff.; Delachenal 2. 234, note 1; cf. R. I. S. 15. 468; 16. 723). Magenta describes him (1. 292) as tall, with light hair, broad forehead, and sparkling (vivo) eyes; his manner was at once grave and amiable, his speech easy and
Galeazzo's chief councilors, and four of his vicars, arrayed like the preceding, but with belts of less value. Then five treasury-officials (rationatores, ragionati), also named, with their attendants; these were similarly arrayed, but with belts of silver. Finally, there was a bishop, with many clergy.

As they entered the old and famous city, the attention of the foreigners would naturally have been drawn to many a strange or renowned building. The procession would first pass S. Eustorgio, then lying outside the city-wall. Here, if any one had had the curiosity, he might have seen the sarcophagus which, until Frederick Barbarossa sent them to Cologne in 1164, had measured, and his temper mild; his plans exhibited a blending of magnificence, firmness, and eagerness; he displayed an ardent love for the beautiful and the sublime, and remarkable subtlety in divining the thoughts of others. For his character, see pp. 21-2.

It may seem strange that one of these was Manfredo di Saluzzo. What should a member of the reigning house of Saluzzo be doing here, serving Galeazzo in the administration of his state?

It came about thus. This Manfredo was the eldest son by a second marriage of Manfredo IV of Saluzzo (d. 1340), whose heir, by his first marriage, was Federigo I (d. 1336), who predeceased his father. The latter had sought, at the instigation of his second wife, to supersede Federigo by Manfredo, but the latter had been established by 1332-3 in the succession to the marquisate, which he left on his death to his son Tommaso. Meanwhile, Manfredo, on the death of his father, sought to oust his nephew, Tommaso, from the marquisate. At the end of the first six months Tommaso was deposed (April, 1341); Manfredo (now Manfredo V) was in possession till March 27, 1344; then Tommaso till May 13, 1344; then Manfredo till September 6, 1346; then Tommaso till Aug. 15, 1357, when he died (Cappelli, Cronologia, p. 357), to be succeeded by his son, Federigo II. At some time after he had ceased to reign (probably in 1354, or soon after; M. H. P., p. 991), Manfredo resorted to Milan, where he was made much of by Galeazzo, who appointed him a councilor. At his own instance, or by his own fault, he retired from Galeazzo's court, Azarius says in 1362 (R. I. S. 16. 405; cf. M. H. P., p. 968). He did not die till after Aug. 5, 1389 (M. H. P.); and he must have been born, one would think, at least 70 years before, since his father contracted his first marriage in 1303, and he himself was probably of age when he contested his nephew's succession in 1340. If he were born (say) in 1318, he would have been 50 years old at Lionel's marriage. How he came to be counselor then, if Azarius is right, is difficult to see; either Azarius is mistaken in the year, as seems most probable, or else Galeazzo had taken him back. The chroniclers call him a handsome man, wise, prudent, and upright.

For Galeazzo's councilors in general, see R. I. S. 16. 403.
contained the relics of the Three Magi, besides the splendid Gothic monument to Peter Martyr,\textsuperscript{62} erected some thirty years before.\textsuperscript{63}

Entering at the Porta Ticinese, the guests of Galeazzo would next have seen, on the right, the most striking piece of Roman architecture in the city, a porch of sixteen Corinthian columns,

just behind which rose the oldest church of Milan, S. Lorenzo. Turning into the present Via Torino through the Porta Ticinese of the inner, or Roman wall, the procession would have passed

\textsuperscript{62} Figured in Venturi, pp. 547-561.

\textsuperscript{63} Here every year, beginning with 1336, at the Feast of the Epiphany (Twelfth Night, Jan. 6), the following ceremony took place (Giulini 5.
near the church of S. Giorgio, with the adjoining palace belonging to Galeazzo (Corio, p. 438), the palace and baths named after Trajan and Maximian (near the present Palazzo Trivulzio), and the church of S. Satiro, finally reaching the Summer Metropolitan Basilica of Santa Tecla (Pl. 2), facing the Via Torino in such a way as to require a detour just where the street now debouches into the Piazza del Duomo. Thence by Santa Maria Maggiore (Pl. 1) to the Archiepiscopal Palace (Pl. 39), where at least the chief guests were to be lodged. Somewhat south of west lay S. Ambrogio, and, some distance south of that, S. Vincenzo in Prato.

243): Three men, attired as kings, and followed by servants and apes, rode from the Carrobbio, where the Corso Porta Ticinese now joins the Via Torino, out to S. Eustorgio. On the way they were stopped by Herod and the scribes, who were seated near the Roman columns in front of S. Lorenzo, and asked whither they were going. Arrived at S. Eustorgio, they deposited their gifts on the high altar, which represented the manger at Bethlehem, and lay down to sleep. After a time, they woke with a start, as if by a divine impulse, and continued their journey through the Porta Romana (outside of which was a Roman triumphal arch).

64 See p. 57, note 2.
65 Corio; *Annal. Med.; Frag.*; Giulini 5, 511.
66 Milan was as yet poor in sculpture and painting. Had the English visitors been in Florence, they might have admired Giotto's paintings in the Peruzzi and Bardì chapels of Santa Croce; the frescoes of the Spanish Chapel (see Ruskin's *Mornings in Florence*); the Orcagnas of the Strozzi chapel in Santa Maria Novella, and his richly carved tabernacle in Or San Michele; Taddeo Gaddi's work in the Baroncelli (Giugni) chapel of Santa Croce; besides Gaddi's Ponte Vecchio, and Giotto's Campanile. Had they been in Pisa, there were the frescoes of the Campo Santo; or in Padua, Giotto's frescoes in the Scroveggi chapel (we are reminded that Francesco da Carrara, the ruler of Padua, received six years later, as a bequest—dated April 4, 1379—from Petrarch, a Madonna by Giotto, whose beauty, according to the poet, whatever the ignorant might think of it, was sure to be admired by the masters of art: 'Quia . . . ego nihil habeo dignum se, dimitto tabulam meam sive iconam Beata Virginis Mariae, operis Joctii pictoris egregii, . . . cujus pulchritudinem ignorantes non intelligunt, magistri autem artis stupent'). We shall hardly be far wrong in assuming that the art of the period was somewhat too austere to have suited the taste of the joyous guests. Magnificence was the note of the Visconti: the Castello at Pavia (cf. pp. 43, 80) had just been built, and the new Cathedral of Milan was to be begun in 1386. Painting and sculpture, however, were not to flourish in Milan during the rest of the century (cf. Giulini 5, 661).
V. LIONEL AND VIOLANTE

As the day for the wedding approached, the thoughts of everyone would turn more and more to the chief actors in the scene, Lionel and Violante.

I. LIONEL

Lionel was too young to have played a very important part on the world's stage, being not yet 30 years old. For the chivalric imaginings which presided at his birth and christening, see Appendix A. It would have been a long forecast which could have seen that he should get kings, though he were none—that from him, through his first marriage, should lineally proceed a monarch who should revive and surpass, on the Field of the Cloth of Gold (1520), the splendors of Lionel's second marriage. He himself had been most conspicuous in the service of England during his five years' residence in Ireland as viceroy\(^1\) (1361-6), an office the importance of which has been thus set forth by Camden\(^2\):

Their jurisdiction and authority is really large and Royal: they make war and peace, have power to fill all Magistracies and other Offices, except some very few; to pardon all crimes but those of high treason, and to confer Knighthood, etc. . . . Whether we consider his jurisdiction and authority, or his train, attendance, and splendor, there is certainly no Viceroy in Christendom that comes nearer the grandeur and majesty of a King.

As for Lionel's appearance, Hardyng\(^3\) tells us little except that he was tall:

In all the world was then no prince hym like
Of hie stature and of all semelynesse;
Above all men within his hole kyngrike
By the shulders he might be seen, doubtlesse;
As a mayde in halle of gentilnesse,
And in all other places sonne to rethorike,
And in the felde a Lyon Marmorike.\(^4\)

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\(^1\) See Hist. Background, pp. 179-181.
\(^3\) Chronicle, ed. Ellis, p. 334.
\(^4\) Belonging to Marmarica, the modern Barca, in northern Africa.
On the other hand, as Lionel's is among the effigies surrounding the tomb of Edward III in Westminster Abbey, which is one of the finest works of its kind belonging to the 14th century, we may turn to that with some confidence to gain a notion of Lionel's face and form, though presumably it is only the effigy of the king himself which can be absolutely depended upon for faithfulness.\(^5\)


\(^6\) It is figured in Carter, *Specimens of Ancient Painting and Engraving in England*, new edition, 1887, plate lxii (the third figure), and in Gardiner, *Student's History of England*, p. 264, from which it is here reproduced.

\(^7\) However, the drooping mustaches of the Black Prince, in the effigy from his father's tomb (Gardiner, p. 264), agree with those on his own
2. VIOLANTE

As she was born in 1355, or at earliest near the very end of 1354, Violante can hardly have been much more than 13 years old on June 5, 1368. She is called beautiful by the chroniclers. It must have been a blonde beauty, one would think, like that tomb at Canterbury (Gardiner, p. 256); but allowance must be made for the fashion of the time (Encyc. Brit., 11th ed., 3. 576). See the picture of Edward III's tomb in Gardiner, p. 263; cf. Shakespeare, Richard II 3. 3. 105-6.

8 Deduced from the statement of Chron. Plac. (R. I. S. 16. 546-7), where she is described as dying in November, 1386, and as not having 'ultra annos XXXII.' If she had been born at any time before November, 1354, she would have been over 32; her birth must consequently have been later than that date. The Milanese annalist says (R. I. S. 16. 778): 'anno setatis sue XXXII,' but mistakes the year, calling it 1383. That the latter is not correct is shown (1) by the carelessness of this document in other respects (e. g. 'in paucis diebus habuit tres viros'), (2) by the fact that Chron. Plac. is approximately right in saying that she died after her third husband had been in prison two years, or thereabouts (he was actually taken prisoner in May, 1385; cf. R. I. S. 16. 784-6, 853), since the time was actually a year and a half.

8 'Tenera dy etade' (Cron. Saluzz., p. 1013); 'tenera sua figliola' (Cron. Monf., p. 1212). She was about the age of Lionel's own daughter Philippa, who was married to Edmund Mortimer just before Lionel left England for Italy (Cont. Eul. Hist. 3. 333; cf. Dict. Nat. Biog. 39. 119). Lionel's first wife, Elizabeth, was nine when he was contracted to her, and he three.

Violante is called Galeazzo's only daughter by the chronicles of Piacenza and Milan (R. I. S. 16. 510, 738), but there had been a younger one. Maria, born in 1357, and dying in May, 1362 (M. H. P., p. 1336; Corio. p. 462).

Boccaccio, too, had had a daughter Violante, for whom see p. 81. The name occurs in the Decameron (5. 7).

There had been earlier Violantes, especially in the houses of Montferrat and Saluzzo; so, for example, one who married, toward the close of the 13th century, Andronicus Paleologus, Emperor of Constantinople, and thus became the great-grandmother of Secondotto (M. H. P., pp. 932, 1325; cf. below, pp. 108-9); and another, the second daughter of Manfredo IV of Saluzzo (d. 1340) by his second wife, who in 1327 married Luchino Visconti (M. H. P., p. 969).

The name, owing to confusion, is sometimes written Yolande, or Yolante.

The Wedding

of other members of her family—beauty naturally suggested by the name ‘English,’ which was attaching itself to the Visconti.

Her character at this time can only be inferred from the impression it produced in her maturity. When we consider that most women would have found her sorrows and trials unendurable, it is no slight thing to have deserved the praise of the Milanese annalist, that she was kind, intelligent, devout, and chaste.

VI. THE WEDDING

After an interview of nine days, the wedding took place on Monday, June 5. The wedding-ceremony itself was performed—probably on a staging or balcony specially erected—over the portal, or central doorway, of the Cathedral of Milan, or rather of what was called the Winter Metropolitan Basilica.

11 Cf. pp. 48, 50. Of Azzo (d. 1339) we are told (Giulini 5. 273) that he was of a rubicund complexion, and that his hair was so fair as to be almost white, but that it shone like gold.


13 For her subsequent history, see pp. 107 ff.


2 Directly across the square from its façade was the small Summer Metropolitan Basilica of Sta. Tecla (No. 4 on plan). The Winter Basilica, or Santa Maria Maggiore, was so much smaller than the present Cathedral that a great part of it was for many years included, with room on every side, within the walls of the present building. It was restored in 1170, the ladies of Milan having devoted their jewels to this purpose. In 1353 it was damaged by the fall of its high campanile, which destroyed several houses. It was at once restored by the archbishop, but could still be described, when it was a question of the erection of the present Cathedral, as ruined and dilapidated (consumptam et dirupatam). The basilica was much shut in by other buildings, but had an enclosed space, or court, in front (Boito, Il Duomo di Milano, p. 11). A good deal of red marble (a speckled sort, brought from near Verona) was used in the old basilica (cf. Boito, pp. 186, 209), and there still remain eight statues of apostles on the wall of the north aisle of the Cathedral, on which Lionel and Violante may have looked (four of them figured in Boito. Pl. 38; cf. pp. 53-4). A description of the old façade, so far as we are informed
This occupied a part of the site of the present Cathedral—which was not begun till 1386—and faced the same way as the latter. A great number of knights, clergy, and other notables were in

![Façade of Santa Maria Maggiore, Milan.](from Rosmini 2. 212.)

about it, is given by Boito (p. 134), and other particulars concerning the basilica are scattered throughout his book (see the index on p. 315). New doors for it had recently been constructed by order of Galeazzo, from the proceeds of a tax laid upon the merchants of Milan. They were of marble, lined (intus) with beautiful reliefs (intaliiis), and were very costly (R. I. S. 16. 403-4). Some notion of the façade may be gained from the illustrations below, the first, and perhaps the more trustworthy,
attendance. According to custom, the bride was supported by two of her kin, who gave her away, as it were, and one of whom held her finger for the placing of the ring. The two kinsmen were in this case the uncles of the bride, Bernabò Visconti and Amedeo of Savoy, the former of whom is described as holding her finger. As the Bishop of Novara, Oldrado, celebrated high mass in the basilica with great solemnity, and accompanied by numerous clergy, it is probable that it was he who performed the ceremony of uniting the couple.

Façade of Santa Maria Maggiore, Milan.
(From Boito, Il Duomo di Milano, title-page.)

being from Rosmini (2. 212), and the second from Boito (as above, title-page).

^Corio; Annal. Med.; Frag.

4 Who had unexpectedly come from Guastalla, with a picked body of nobles (Corio, p. 469); cf. pp. 47-8.

^Annal. Med.

6 Corio; Annal. Med. Perhaps we may understand that both did. Corio mentions only Bernabò; Annal. Med. mentions Bernabò, ‘qui tenuit digitum sponsæ una cum Comite Sabaudie avunculo suo, videlicet ambo a lateribus sponsæ.’

7 Corio; Annal. Med.; Frag.

8 So Giulini 5. 511.


10 Frag.
VII. THE BANQUET

On the day\(^1\) of the wedding a magnificent banquet\(^2\) was served. What may be called the classic account of this was written by Paulus Jovius (1483-1552) long after the event, though no doubt reposing on good contemporary authorities. His description is as follows:

Leonati porro adventu tante opes admirabili liberalitate profuse sunt, cum et nuptiale epulum daret, et equestres ederet ludos, et Britanos ex generis comitatu supra ducentos eximis donis adornaret, ut opulentissimorum Regum splendorem superasse censeretur. In convivio enim, in quo Franciscus Petrarcha inter principes convivas discubuit, singulos ferculorum missus, qui supra triginta fuere, totidem insignes argenteis et sericis ephippiis strati\(^4\): in alis vero vasa argentea,\(^5\) hierofalcones,\(^6\) venatici canes,\(^7\) equestria arma,\(^8\) nobiles loricae, solidoque ferro splen-

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\(^1\)Corio; *Annal. Med.; Frag.* Gabotto (*Misc. di Stor. Ital. 33. 169*) says the banquet took place on the *evening* of the wedding-day (‘quella sera vi fu un convito’). Giulini (5. 512) represents the company as proceeding directly from the basilica to the banquet.

*Cron. Monf.*’s ‘la dominicha nella dispensatione’ must be a mistake, one would think. The wedding took place on June 5, which was a Monday. The previous day was Trinity Sunday, and of course the next Sunday was June 11. Presumably the wedding-feast would not be held before the wedding, and an interval of six days would have been too great.

\(^2\)Corio: ‘un splendidissimo convito’; *Annal. Med.*: ‘in prandio fecit maximum convivium’; *Frag.*: ‘uno grande desinare.’ Cf. that when Gian Galeazzo was made duke in 1395 (Corio, p. 539), and see the eulogy of this one in *Cron. Monf.* (p. 1225).

\(^3\)Cf. *p. 73.*

\(^4\)Cf. pp. 68, 71, 72.

\(^5\)Cf. *p. 69.*

\(^6\)Cf. pp. 66, 67.

\(^7\)Cf. pp. 66, 67.

\(^8\)Cf. pp. 68, 71, 72.

\(^9\)In 1360, the Green Count sent as a present for the wedding of Gian Galeazzo and Isabella of France five suits of armor which he had had made specially, and which cost 145 florins (Cordey, *Les Contes de Savoie*, p. 157). The original account runs (*ib.*): ‘Item a Jacob Lo Platier pour v payres de plats par mon seigneur [Gian Galeazzo?] et par monseigneur
The whole passage is thus rendered by Barnes, who, it will be seen, is indebted in part to Stow:

Galeache et mosse Barnabo, VII\textsuperscript{xxv} flor.' According to this, a suit of this armor would have cost not less than $400 (cf. p. 29). Henry, Earl of Derby, the future Henry IV, in preparation for his combat in the lists with the Duke of Norfolk (Sept. 16, 1398), sent to Gian Galeazzo for special armor (cf. Shakespeare, \textit{Richard II} 1. 3. 28, 'Thus plated in habiliments of war'; 1. 3. 73, 'Add proof unto mine armor with thy prayers'). Froissart's account of this is as follows (Kervyn 16. 95-6; cf. \textit{Archäologia} 20. 102; \textit{Dict. Nat. Biog.} 26. 34; 39. 234; Adam of Usk, p. 23): 'Et envoia le conte d'Erby grans messages en Lombardie devers messire Galléas, duc de Milan, pour avoir des armures à son point et à sa voulenté. Le dit duc descendy moult lyement à la prière du conte d'Erby, et mist à choiz ung chevallier, qui se nommoit messire Franchois, que le conte d'Erby avoit là envoiè, de toutes ses armures pour servir le dit conte. Apercues tout ce, quant le chevallier dessus nommé eut advisé et choisy entre toutes les armures tant de plates comme de mailles du seigneur Galéas de Milan, le dit seigneur de Milan, d'abondance et pour faire plaisir et amour au conte d'Erby, ordonna à quatre des meilleurs armoieurs qui fuissent en Lombardie, à aller jusques en Angleterre avec le dit chevallier pour entendre à armer à son point le conte d'Erby.' The Milanese armor of this period, it will be seen, included mail as well as plate.

\begin{itemize}
\item \textsuperscript{10} Cf. pp. 68, 71.
\item \textsuperscript{11} Cf. p. 72.
\item \textsuperscript{12} Cf. pp. 72, 73, 74.
\item \textsuperscript{13} Cf. p. 72.
\item \textsuperscript{14} Cf. pp. 69, 73.
\end{itemize}

\textsuperscript{15} In the romance (stanzas 71, 72) of \textit{The Sege of Melayne} (1350-1400) we are told of a gift which included 60 steeds, ridden by as many knights, each bearing a falcon and a cup of gold, and with a greyhound and a rache for each. Cf. also the description in Boccaccio, \textit{Teseide} 6. 8, 9:

\begin{quote}
A chi prender volea davano assai:
Canì, falconi e astor di gran prodez\`{a}
Usavano a diletto. . . . . .
Vestivan robe per molto oro care,
Con gran destrier, cavalli e palafreni,
E nulla si lasciavano a donare,
Si eran d'ogni gran larghezza pieni.
\end{quote}

\textsuperscript{16} P. 719.
Duke Galeas in Honour of this his Son-in-Law is said to have spent such abundance of Treasure, as seem'd to surpass the Magnificence of the most Wealthy Monarchs. For not to mention all the Sumptuous Feasts, Balls, Justs, and Tourneaments, and other stately and divertive Spectacles, set forth on this occasion; nor to summe up the great and large Gifts, which were given to the Lord Edward Spencer, and more than 200 other English Gentlemen, who came out of England to wait on the Prince; the Marriage Feast alone was so extraordinary, that We may by that Conjecture the Largeness of Duke Galeas his Soul, the full satisfaction he had in this Match, and the Abundance of his Coffers. For in that One Feast, where Francis Petrarch, the Laureate Poet of Italy, was present, being for Honour of his Learning seated among the Guests of the Highest Quality, there were above 30 Courses of service upon the Table, and between every Course, as many Presents of unusual Magnificence, intermixed; all which John Galeas, the Duke's Son, and Prince of the Chosen Youth, that waited that day, presented unto Prince Lionel, as they were brought up to the Table.

In one Course were presented Seventy Good Horses, richly Adorned and Caparizon'd with Silk and Embroider'd Furniture; and in the other Courses, came up Vessels of Silver, Ger-Falcons, Hounds, Armour for Horses, Costly Coats of Mail, shining Breastplates of Massy Steel, Corslets, Helmets, and Burganets adorned with High and Rich Crests and Plumes; Surcoats embroider'd with costly Jewels, Knights Girdles, and lastly, Pictures of Gold, beset with Gems, and Purple and Cloth of Gold for Mens Apparel in Great Abundance. And such vast Provision was there at this Feast, that the Meats, which were brought from the Table, would have plentifully sufficed 10000 Men.

The second paragraph was thus translated by Stow, *Annales*, 1592, p. 416:

There were in one onely course seventy goodly horses, adorned with silke and silver furniture: and in the other silver vessels, falcons, houndes, armour for horses, costly coates of mayle, breastplates glistering of massive steele, helmets, and corselets [sic] decked with costly crestes, apparell distinct, with costly jewelles, souldiers girdles, and lastly certaine gemmes, by curious art set in golde, and of purple, and cloth of golde for mens apparell in great abundance. And such was the sumptuousnesse of that banquet, that the meates which were brought from the table, woulde sufficiently have served 10000 men.

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17 Sandford is indebted to both Stow and Barnes; thus, for example, 'glistering of Massie Steel.' Jovins' account is also the basis for the description by G. P. R. James, *History of Edward the Black Prince*, 2d ed., 2. 311. Cf. Hist. Background, p. 186.
The feast was held in the courtyard which occupied the centre of the public square adjoining the basilica. This square was known as the Piazza dell' Arengo,\(^{18}\) Place of Harangue, or Forum, where in ancient times the people of the city assembled to listen to their leaders, and deliberate on public questions. The palace situated on this square (Pl. 40; see p. 52) had been burned down during the rule of Matteo Visconti I, and rebuilt by him (1295), with the addition of a tower.\(^{19}\) It was in the court of this edifice\(^{20}\) that the banquet was served,\(^{21}\) perhaps in the marble loggia built by Matteo I in 1316 (R. I. S. 16. 698),

\(^{18}\) Also called Broletto Vecchio (Giulini 7. 336). The Broletto, or Palazzo Arengario, at Monza, still exists.

\(^{19}\) Giulini 4. 407, 772.

\(^{20}\) The present royal palace occupies nearly the same spot. The church or chapel of S. Gottardo belonged to the old palace; its apse and beautiful campanile (pictured in Giulini 5. 216), the latter dating from 1336, are still to be seen in the Via del Palazzo Reale. The monument to Azzo Visconti (1328-39), by the sculptor of the monument to Peter Martyr (see p. 52), Balduccio of Pisa, which was formerly in S. Gottardo, is to be seen in the Palazzo Trivulzio (it is figured in Giulini, opp. 5. 274).

\(^{21}\) Giulini 5. 512. Corio has 'nella sua corte, sopra la piazza dell' Arenga'; Annal. Med.: 'in Curia magna Arengi'; Frag.: 'nella Corte, sive nello Stallo suo grande per mezzo l' Aringo, sive Piazza del Duomo.' Corte would here naturally be interpreted as 'courtyard,' but it seems sometimes to have been employed for 'palace.' I assume that it here means the courtyard of the palace, rather than the interior of the building itself. However, Aliprando, who wrote his Chronicle of Mantua nearly fifty years after this event, and who must therefore be used with caution (for example, he dates the wedding in May, 1366), speaks of the hundred principal guests as banqueting in one hall (sala), while the rest were accommodated in other halls, since there was not room in a single one for all. Aliprando adds certain particulars, which are at least well invented, though we have no confirmation of them save such as may be gathered from the customs of the time. At the beginning of the feast, there was a blast of trumpets which made conversation impossible. Then the sewers, Galeazzo (wrongly Jovius, p. 60, above) on horseback at their head (this hardly suggests indoors), first bring wine and confections, and then proceed to the kitchen to serve in the courses. Violante was first served by a sewer of noble blood on horseback:

\[
\text{Quello barone} \\
\text{Che lo taglier de la sposa portava} \\
\text{A caval gia.}
\]

Aliprando often varies from the other chroniclers with regard to
while the spectators may have been accommodated as groundlings below. Two tables were spread, one for the men, and one for the women, there being fifty-seven guests in all.22

details of ornament, but of these I make no account, nor of such praise as Più belli cani non fu mai veduto.

Sismondi, Fr. (7. 21, note 2), has no warrant in the chroniclers (except Aliprand) for saying: 'La cour était distribuée à plusieurs tables, selon le rang des personnages.'

22 So Cron. Monf. The other three chroniclers seem to be confused. Corio mentions as being at the first table Lionel, Amedeo, and Despenser, with many other barons, besides the Bishop of Novara. Matteo and Lodovico (see pp. 109 ff.), sons of Bernabò, Petrarch, and other Pisan citizens; Annal. Med.: Lionel, Amedeo, the Bishop of Novara and another Bishop, Marco (not Matteo; Marco was Petrarch's godson, and the latter wrote a Latin poem on his baptism) and Lodovico, Petrarch, with many other knights and nobles of Pisa and other cities; Frag.: Lionel, Amedeo, Despenser, and many other barons, [ ] and Lodovico, Petrarch, and certain other knights and gentlemen of Pisa and other cities. The name of the other son of Bernabò seems to be accidentally omitted in Frag.

At the second table were seated Bernabò's wife, a Scaliger of Verona, by compliment called Regina, with many other ladies (Corio: 'honorable matrons'). At this point the difficulty begins. Corio says: 'honorande matrone per taglieri cinquanta'; Annal. Med.: 'cum multis dominabus, que deferebant per quinquaginta incisoria infrascripta cibaria'; Frag.: 'con altre donne per taglieri cinquanta.' Giulini (5. 512) renders: 'con molte delle principali dame, le quali portavano in tavola i piatti alla prima mensa, cioè per ciascuna portata cinquanta piatti, detti dall' annalista incisoria, e dal Corio taglieri, perchè vi si tagliavano sopra le vivande.' This I interpret to mean: There were fifty guests at each table, and each course was presented to the men of the first table by the ladies of the second, a lady to each dish (literally, trencher). This seems to me unlikely, for the following reasons: (1) Each course was double, consisting of fish and flesh, and there were eighteen courses, so that the task would have been none of the lightest; (2) one can hardly think of Regina della Scala being thus occupied for a good part of a summer's day; (3) there would have been little opportunity for the ladies to partake of the banquet; (4) the Milanese annalist expressly says that Despenser served the first table, assisted by many other magnates; (5) the Fragment says that fish and flesh were served for the Duke's table, and for the table where was seated Madonna Regina.

There remains the question of the total number of guests. Were there (1) fifty-seven guests in all, as Cron. Monf. says, or (2) fifty guests at each table, or (3) fifty-seven at the first, and fifty at the second? I incline to (2). It is not likely that space was lacking, since at the nuptial feast following the return of Galeazzo I and Beatrice d'Este from Modena, where they had been married on June 24, 1300 (the journey from Milan
Tomb of Bernabò Visconti (ca. 1370).
(From a photograph in possession of the Museum of Fine Arts, Boston.)
The details of the banquet are described by Corio, the *Annals of Milan*, the *Chronicle of Montferrat*, and the *Fragment* (besides Aliprando; see p. 63, note 21). These four accounts are in substantial agreement, but vary in particulars. Where they differ, I have endeavored to harmonize them as best I could, and have generally effected a condensation. Here and there I have been unable to translate a word, and in other cases have not been quite certain of the rendering. It will be observed that presents were offered to the guests with each course.

to Modena, June 15-21; from Modena to Milan, June 26-July 3), a thousand persons sat down (Giulini 4. 801). At this earlier feast, open house was kept at the Broletto for eight days; great numbers of actors, jugglers, and buffoons were present; and every one of the thousand guests at the banquet received a suit of raiment (Giulini 4. 801). Moreover, in the year 1277, the greater part of the population of Milan stood in arms at one time within the enclosure (Giulini 4. 636); in 1355 there were 16,000 armed men in Milan (Mézières, p. 279), but the population may well have increased in the interval between 1277 and that year. There would therefore have been room for many spectators at the wedding-banquet of Lionel and Violante.

Regina (b. ca. 1336 or 1337), whom we have mentioned above, seems to have gained this name on account of her regal bearing (Leo 3. 296, note 2; 325, note 1), her Christian name being properly Beatrice (but Giulini, s. 645-6, says Caterina, and is supported by *R. I. S*. 15. 503). She was the daughter of Mastino II of Verona (d. 1351), whose equestrian statue under a canopy, near the Piazza dei Signori, attracts the eye of every traveler at Verona. She was married to Bernabò in September, 1350, at a tender age (*M. H. P.*, p. 1180), and died June 18, 1384, after having borne him 15 children (Corio, p. 509), her last son, Mastino, having apparently been born in 1375 (*R. I. S.* 17. 499; Muratori 8. 415; otherwise Giulini 5. 651). Her epitaph in verse may be read in Corio (p. 504) and *Annal. Med.* (*R. I. S.* 16. 778), where she is called Regina Beatrix. Her tomb is still to be seen in the Archaeological Museum of the Castle of Milan, while in the adjoining room is that of her husband, Bernabò, originally erected (1370), 15 years before his death, in S. Giovanni in Conca (Pl. 52), whence it was removed (1814) to the church of Brera (Rosmini 2. 157, note 2). The latter tomb has a life-size marble equestrian statue of Bernabò (see *R. I. S.* 16. 544-5, 800, 854; Corio, p. 509), accompanied by Fortitude and Justice (see the picture opposite); it is to be compared rather with the nearly contemporary one of Can Signorio (cf. Venturi, p. 590) at Verona than with the bronze statues of Gattamelata (1447) at Padua, and Colleoni (1481) at Venice. Regina built (1381), perhaps with 400,000 golden florins received from the della Scalas in 1379, the church (*R. I. S.* 16. 777) of Santa Maria della Scala (sup-
1. The first course was served double for the duke's table—meat and fish. There were sucking pigs, gilded, with fire in their mouths; the fish were porcelain-crabs [or perhaps sea-snails], also gilded. — The gifts were two greyhounds, with velvet collars and silken leashes. Also twelve brace of sausi, six brace to a leash, their chains being of gilded brass, their collars of leather, and their leashes of silk.

2. The second meat-course was of hares, gilded. The fish-course was of pike, gilded. — The gifts were twelve brace of greyhounds, with silken collars, buckles of gilded brass, and six silken leashes; besides six goshawks, with as many pressed in 1776), on the site of which stands the theatre of that name (Rosmini 2. i47, note i; Leo 3. 325, note i).

See No. 2. But here, where the other chroniclers have 'levr(i)eri,' 'livr(i)eri,' Aliprandi has 'liopardi.' This, after all, is probably the right reading, since (1) there are only two of these, whereas at the second course there are 24; (2) we are told of Gian Galeazzo that though he, like his uncle Bernabò, quartered large numbers of dogs upon his subjects for his use in hunting, he preferred the leopard (cheetah) for this purpose (Religieux de Saint-Denys, ed. Bellaguet, 3. i32; cf. De Noirmont 3. 332-8; Hist. Background, p. 174; Encyc. Brit., 11th ed., 5. 368; 6. 22).

De Noirmont (2. 300) tells of a Frenchman who received from an Englishman (in 1550) six greyhounds, with velvet collars embroidered with gold.

See Nos. 2, 3, 4.

See Nos. 2, 3, 4.

Frag.: sauxi. This seems equivalent to the M.H.G. sîse, defined by Lexer (MHD. Handwörterbuch) as 'eine Art Jagdhund'; Florio: 'a Hound, a Spaniell.'

Cf. De Noirmont 2. 298: 'Dans les comptes de dépenses du roi Jean, Pierre des Livres, orfèvre, reçoit 19 écus pour 4 marcs, 6 onces, 10 estellins d'argent, "à faire la garnison de deux grands colliers garnis de grandes pièces d'argent dorées et faites d'orbevoyes et d'esmaux sartiz à cerfs enlevés à manteaux emmaillé des armes dudit seigneur pour deux grands chiens alans." Les alans de Louis XI avaient aussi des colliers de cuir de Lombardie garnis de clous dorés de fin or et soudés d'argent.'

Spranghe. I have not been able to distinguish in all cases between 'buckle' and 'clasp.' See Nos. 3, 6, 7, 11, 12.

The romance of Partionope (ca. 1450) has (Univ. Coll. 2235-8):

Coupled with sylk and not wyth heere,
Lemours aboute her nekkes bere
Her lees were as softe as sylk,
And therto whyte as ony mylk.

Astori. See Nos. 4, 5.
creances, and silver buttons enameled with the devices of Galeazzo and the duke, besides buttons.

3. The third meat-course was a large calf, gilded. The fish-course was of trout, gilded. — The gifts were six alaunts, and six large striv(i)eri, with velvet collars, buckles and rings (links ?) of gilded brass, and six silken leashes.

4. The fourth meat-course was of quails and partridges, gilded. The fish-course was of roasted trout, gilded. — The gifts were twelve sparrow-hawks, with bells of gilded brass, creances and branching cords of silk, and buttons of gilded silver, enameled with the arms of Galeazzo and Duke Lionel; besides twelve brace of setters, with gilded collars, twelve chains of gilded brass, and six leashes of silk.

5. The fifth meat-course was of ducks and herons, gilded. The fish-course was of carp, gilded. — The gifts were six peregrine falcons, with hoods of velvet, having pearls on top, and buttons and rings (links ?) of silver, wrought with the
arms of Galeazzo and the Duke of Clarence; and with silken creances, having buttons of pearls at the top.

6. The sixth meat-course was of beef, and of fat capons with sauce of garlic and vinegar. The fish-course was of sturgeons in water. The gifts were twelve steel corslets without collars, of which two, for the duke in person, had the buckles and bosses of gilded silver, wrought with the arms of the lords aforesaid, while the others were of gilded brass.

7. The seventh meat-course was of capons and meat in lemon-sauce. The fish-course was of tench in lemon-sauce. The gifts were twelve tilting-panoplies, including saddles, lances, saiti, and helmets. Two of the panoplies and saddles, for the duke in person, were adorned with eamed silver, wrought with the arms of the duke, the buckles, bosses, clasps, and hooks being gilded. The others had ornaments of gilded brass.

8. The eighth meat-course was beef-pies served with cheese. The fish-course was of large eels in pies. The gifts were twelve war-panoplies; two, for the duke, being ornamented with his arms in silver gilt, while the others had trimmings of gilded brass.

9. The ninth meat-course was of meat-aspic. The fish-course

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69 Panzeroni, panzere. Florio defines pancierone as 'a bellie-piece of armour.' See p. 62.
61 Fibbie.
62 Mazzi, maz(i)i.
63 Alip.: veal.
64 Tenconi; pesce.
65 See Nos. 11, 12.
66 Saette, 'darts' (?).
67 See Nos. 11, 12.
68 Cron. Monf.: of the lords named; Frag.: of the aforesaid lord and duke.
69 Fib(b)ie; schive, schibbe. See Nos. 7, 11, 12.
69 Spranghe.
61 Ronchette; rocchetti; domenini.
62 Alip.: the dough kneaded up with cheese and sugar.
63 Alip.: sugared, and with good spices!
64 See No. 7.
65 See Nos. 11, 12.
66 Alip. adds: and chicken-aspic.
was of fish-aspic. — The gifts were twelve\(^6^7\) pieces of cloth of gold, and as many of silk.\(^6^8\)

10. The tenth meat-course was of meat-galantine. The fish-course was galantine of lampreys. — The gifts were two large bottles of gilded and enameled silver, one filled with the choicest vernaccia,\(^6^9\) and the other with the choicest malmsey; besides six bowls\(^7^0\) of gilded and enameled silver, with goblets to match.

\(^6^7\) Frag., Cron. Monf.: ten.

\(^6^8\) Alip.: colored silk, except one of white.

\(^6^9\) If Chaucer learned of the details of this feast, it is not surprising that, when his liberal and luxurious young monk of Paris comes to St. Denis to visit his 'cousin,' the merchant, he should bring with him as a present precisely these two wines (Shipman's Tale 70-71):

> With him broghte he a jubbe of Malvesie,
> And eek another, ful of fyn Vernage.

Malvoisie, or malmsey, was a Greek wine, brought from Monemvasia, or (Napoli di) Malvasia, on the east coast of the Morea, the wine itself being produced not there, but in Crete, which was one of the chief sources of supply (Heyd, Gesch. des Levantehandels i. 309; Pashley, Travels in Crete 2. 54-56), and in the Cyclades. Vernaccia, or vernage, on the other hand, was an Italian wine, white, strong, and sweet, originally, and perhaps typically, coming from the Genoese Levant, especially from the Cinque Terre of the sheltered Riviera near Spezia, a territory which includes the towns of Vernazza and Corniglia. The vernaccia of Corniglia is mentioned by both Boccaccio (Dec. 10. 2) and his contemporary, Franco Sacchetti, who speaks of having it brought from Portovenere, a little further down the coast. This southern part of the Riviera di Levante is thus described by Petrarch (Africa 6. 842-4, 848-853):

> Sensim turgescere colles
> Cedriferi, nullique cedens his saltibus ora
> Incipiunt, raræque virent per littora palmæ. . . .
> Parte alia sinuosa patent convexa Siestri;
> Hinc solis vineta oculo lustrata benigno,
> Et Baccho dilecta nims, Montemque Rubentem,
> Et juga prospectant Cornelia palmite late
> Inclytæ mellifluæ, quibus haud collesque Falernos
> Laudatamque licet Meroen cessisse pudebit.

(Now gradually rise the cedared hills along the shore, and here and there grows a palm tree. Near the curved beach of Sestri, vineyards flourish in the sun—Monterosso, and the heights of Corniglia—famous for honey-sweet wine, excelling even those from the Falernian hills and much-praised Meroe.) Monterosso, two miles from Vernazza, and four from Corniglia, produced a wine which we find mentioned as Montrose in the Manière de Langage of 1396 (Revue Critique of 1870, Paris, 1873), p.
11. The eleventh meat-course was of roasted kids. The fish-

392 (cf. Squyr of Lowde Degre 756): 'Item de vins doucetes, comme de vin de Grece, Ipocras, Montrose, Rumney [Roumania], Vernage, Malvoisin, Osey [Alsace], clarrey et pyemient.' The vines of the Cinque Terre grow in some cases against perpendicular rocks, and must be reached by means of ladders or ropes (Bædeker, Oberitalien, 18th ed., p. 512).

Fra Salimbene, writing late in the 13th century, speaks of Chiavari, 26 miles from Corniglia in the direction of Genoa, as being not far from the place where an abundance of vernaccia was produced—a wine so good that to it might well be applied the lines of a certain goliard (Mon. Germ. Hist. Script. 32. 572, cf. 642), thus translated by Coulton (From St. Francis to Dante, p. 209):

O precious juice of the vine, what gift hath life like thine?
If two sorts come to the feast, then fill me a cup of the best!
Small is the profit to me if I suck down less than three;
Sweet is the fourth full bowl, and deep is the calm of my soul;
But the fifth cup sets me adaze, and my memory all in a maze;
With the sixth I desire no more, but sprawl full length on the floor.

According to Gower (Conf. Am. 6. 218-9), vernage and piment were the standard of sweetness in wines. According to an account alluded to by Dante (Purg. 24. 24), Pope Martin IV died of eating too many eels, either drowned or cooked in vernaccia. Benvenuto Rambaldi, a commentator on the passage, informs us: 'La vernaccia è un ottimo vino, che viene dai monti di Genova'; similarly Buti: 'Vernaccia è vino che nasce ne la riviera di Genova, millior vino che si trova.' Chaucer refers to it as an aphrodisiac (Merchant's Tale 563-4; the scene is in Pavia):

He drinketh ipocras, clarree, and vernage,
Of spyces hote, t'encresen his corage.

What wine could better suit our monk as a present to his friend's beautiful and revelous wife? It was sweet, and it was strong.

As the best of wines (see Buti, above), it must have been, one would think, costly; yet the monk is represented as bringing a jubbe of it, and a jubbe of malmsey, when the New Eng. Dict. defines a jubbe as 'a large vessel for liquor.' This must certainly be true of those that held four gallons (according to the quotation in the New Eng. Dict.); but was this the only sort, the only size? Levins, in 1570, defines it as cantharus, scyphus, and the Middle English Destruction of Troy (11,940) speaks of 'jobbes of gold,' in conjunction with gems and jewels. Even the jubbe of the Miller's Tale (441-3) held only ale enough for a day, presumably for one person; here Hertzberg translates 'jubbe' by 'Krug,' and in the Shipman's Tale by 'Fläschchen.' It is easy to see, then, that the 'bottazzi (botacii),' 'fiaschi,' of the chroniclers, gilded and enameled though they were, may very well be represented by Chaucer's jubbes, and that it would not be strange if Chaucer remembered them when he was sketching the portrait of the free-living and free-handed monk.

79 Alip.: e sci bronzini.
course was of roasted garfish.\textsuperscript{71} — The gifts were six beautiful little coursers,\textsuperscript{72} with gilded saddles and trimmings, six lances,\textsuperscript{73} six beautiful shields,\textsuperscript{74} painted and gilded, six hats\textsuperscript{75} of polished steel—two with bosses and clasps\textsuperscript{76} of silver gilt and enameled, for the duke himself, and the rest with clasps of gilded brass.

12. The twelfth meat-course was of hares and kids in chive-sauce\textsuperscript{77} or pickle.\textsuperscript{78} The fish-course was of various fish in chive-sauce. — The gifts were six great coursers, with gilded saddles and trimmings, wrought with the arms of Galeazzo and the duke—two with clasps and bosses of silver gilt for the duke, and the rest of gilded brass; besides six lances, six shields, and six [steel] hats gilded and wrought as above—two for the duke with clasps\textsuperscript{79} and bosses of silver gilt, and the rest of gilded brass.

13. The thirteenth meat-course was of venison and beef in moulds.\textsuperscript{80} The fish-course was of fish turned inside out (?).\textsuperscript{51} —The gifts were six beautiful little steeds,\textsuperscript{82} with gilded headstalls,\textsuperscript{83} with reins\textsuperscript{84} and caparisons\textsuperscript{85} of green velvet, and rosettes,\textsuperscript{86} buttons, and tassels\textsuperscript{87} of crimson silk attached to the caparisons.\textsuperscript{88}

\textsuperscript{71} Agoni (Cron. Monf.: papari; Alip.: pavari, besides agoni).
\textsuperscript{72} See Nos. 12, 13, 14, 18.
\textsuperscript{73} See No. 12.
\textsuperscript{74} See No. 12.
\textsuperscript{75} See No. 12.
\textsuperscript{76} Fibbie. Alip. substitutes here: a hat elaborately decorated with pearls.
\textsuperscript{77} Ziverio (civiere, civerio), certo sapore.
\textsuperscript{78} Cron. Monf.: salza; Alip.: acinerio zuccherato[ !]
\textsuperscript{79} Fibbie.
\textsuperscript{80} Alip. adds: with sauce of sugar and lemon.
\textsuperscript{81} Cron. Monf.: pesci riversati; Corio: pichi reversati; Annal. Med.: pechii reversati; Frag.: pighi reversati; Alip.: tinche grosse roversciate, con altri pesci.
\textsuperscript{82} See No. 11.
\textsuperscript{83} Briglie; brene.
\textsuperscript{84} See No. 14.
\textsuperscript{85} See No. 14.
\textsuperscript{86} Fiocchi.
\textsuperscript{87} Pendagli, pendoli.
\textsuperscript{88} The four accounts do not altogether agree, and the details are somewhat obscure to me.
14. The fourteenth meat-course was of capons and fowls in red sauce and green, with oranges. The fish-course was of tench turned inside out. — The gifts were six great tilting-steeds with gilded headstalls,\(^9\) reins of crimson velvet, and housings of crimson velvet, adorned with buttons, bosses, and tassels, all of gold.

15. The fifteenth meat-course was of peacocks,\(^9\) with cabbage, French beans, and pickled ox-tongue. The fish-course was of carp. — The gifts were a doublet and hood of satin covered with pearls, and with a large flower wrought of pearls on the hood. Over all was a cloak lined with ermine, as was the hood, and also covered with pearls.\(^9\) All these garments were carried to England.\(^9\)

16. The sixteenth meat-course was of roasted rabbits, peacocks, fieldfares(?),\(^9\) and ducklings. The fish-course was of roasted eels. — The gifts were a beautiful great silver basin, with an emerald, a clasp,\(^9\) a ruby, a diamond, a large pearl set in a ring, and five silver belts (including one given after the day of the feast), gilded and enameled.\(^9\)

17. The seventeenth course was of junkets and cheese. — The gifts were twelve splendid fat cattle.

18. The eighteenth course was of fruit, including cherries. — The gifts were two handsome coursers belonging to the Count of Vertu (Gian Galeazzo), one of which was named Lion, and the other Abbot. On the barons and gentlemen of the Duke

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\(^9\) This is the realization of a poetic fiction (Virgil, Æn. 8. 168):

Frenaque bina meus quæ nunc habet aurea Pallas.

Cf. Chaucer, K. T. 1648-9:

The fomy stedes on the golden brydel
Gnawynge.

\(^9\) But Cron. Monf.: pipioni; Alip.: piccioni.

\(^9\) Cron. Monf. extends this: ‘Poi fu presentato uno manteletto suffulto et fodrato d’armellino, uno farsetto et uno capucio di raso, quali tutti erano coperti de pelle [i. e. perle]. poi uno manto et uno capucio facti a fascie, ornati de perle.’

\(^9\) So only Cron. Monf.

\(^9\) Cesani, cisoni.

\(^9\) Alip. has: a clasp of diamond and ruby, with a pearl.

\(^9\) Cron. Monf. adds: two beautiful jewels wrought of pearls, balas rubies, emeralds, sapphires, and other costly gems.
of Clarence were bestowed seventy-six horses. All these were presented by the magnificent and noble lord Galeazzo Visconti, who was the steward of the feast, and who was accompanied throughout by twelve knights.

Aliprando adds that after the ladies and gentlemen had washed, wines and confections were served; that Bernabò distinguished himself by his liberality, so that a song was made upon it; and that Galeazzo distributed robes, and Bernabò money, to the mountebanks, minstrels, and acrobats.

The *Chronicle of Montferrat* proceeds to detail the gifts made to seven of the chief men of the retinue, ending with the statement that the other seventy fared similarly.

The seven men were Sir Edward Despenser (called the Seneschal), Sir Edward Contenaim, Lord Bassett, Sir Hugh Despenser, Sir Thomas Granson, Sir Robert Assheton, and Sir John of Bromwych (Broncio). The typical gifts—one to each man—were (1) silver belts, gilded and enameled; (2) pieces of cloth of gold; (3) jousting-steeds; (4) coursers. Individuals were distinguished by additional articles, or by more than one of a kind. Thus Edward Despenser had two coursers, instead of one, and two pieces of gold brocade, with two pieces of silk brocade of Bagdad (*baldachino brocato*), instead of one piece of cloth of gold. Contenaim had one piece of gold brocade, and his cloth of gold (three and a half ells) was wrought with coronets, besides which he had three and a half ells of woollen cloth, wrought with the arms of Bavaria. Bassett, who was, next to Bromwych, the most shabbily treated of those named, had the belt, the cloth of gold, and a beautiful and valuable courser. Hugh Despenser's cloth of gold was like Contenaim's, and he had three and a half ells of woollen cloth (*de Baucia*,

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96 So Corio; *Cron. Monf.*; but *Annal. Med.*: 77. Jovius (p. 60) has the round number, seventy, and Aliprando a hundred and fifty, besides robes and jewels according to the rank of each. Cf. *Hist. Background*, p. 185.

97 Corio; *Annal. Med.*

98 See *Encyc. Brit.*, 11th ed., 7. 238. Devon (*Issues of the Exchequer*, p. 170) mentions a belt garnished with rubies, emeralds, and pearls, for which £18 (= $1350) was paid (July 6, 1359).

99 See pp. 104 ff.

100 Hugh Despenser and Lionel were brothers-in-law, having married two daughters of Gilbert, Earl of Gloucester, Lionel the first, and Despenser the second (*Knighton* 2. 31).
which I cannot interpret). Granson was distinguished by an additional courser, and two more when he went to England—four in all. Assheton had two belts, one presented the day of the wedding, and one afterwards. Finally, Bromwych had only a belt, and a fine courser when he went to England.

There must have been tilting, as was customary on these splendid occasions, for the Chronicle of Montferrat records that for furnishing 30 jousters with everything requisite to make a becoming appearance (de tutto quello che ricerca una degna giostra) Galeazzo disbursed 72,430 florins. Aliprando declares that every day—but does not say for how long—there were jousts and tourneys, band pitted against band. As for the ladies, they took pleasure in playing, singing, and dancing. He ends with comprehensive praise of

\[
\text{quella corte grande,}
\]

\[
A' \text{ Visconti perpetual' onorare.}
\]

**VIII. PETRARICH AT THE BANQUET**

The chroniclers all record the presence at the first table, among the civil and military magnates there assembled, of Petrarch,

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1 Granson is subsequently mentioned in Rymer: May 8, 1369; July 1, July 8, Nov. 26, 1370; Oct. 29, 1372; Oct. 28, 1375; practically always as being in the king’s service.

2 Assheton (called Aston Feb. 11, 1366) was chancellor of Ireland from Oct. 24, 1364 till some time in 1366; was one of three to pay a sum of money to Lionel on Oct. 29, 1366, for the wages of his forces in Ireland (cf. Hist. Background, p. 188, note 1); had protection to accompany Lionel abroad, March 13, 1368; with Thomas de Dale, who had been associated with him in Ireland, had charge of arrangements for transporting Lionel’s company from Dover to Calais in the spring of 1368; was admiral of the western fleet in 1371; justiciary of Ireland, 1372-3; in the train of John of Gaunt to go abroad, 1374; treasurer of England, 1376; chamberlain of England, 1377.

3 For Bromwych, see pp. 97-8.

4 See p. 60.

5 Say $815,000; cf. p. 29.

6 See also Magenta i. 131-2.

7 For the baseless story of Petrarch’s Academy of thirty members at Linterno, all of whom were invited to the wedding and regaled the company with as many epithalamiums, see De Sade, pp. 722-3; Giuliani 5. 516. Cf. F. Petrarca e la Lombardia, p. 109.
who was generally regarded as the greatest man of his age. Petrarch was there, Froissart was there, and perhaps Chaucer was there. Froissart, then, probably saw Petrarch, and possibly Chaucer did; but is either one likely to have become personally acquainted with him? In attempting to answer this, we must reflect (1) that Froissart does not speak of such a meeting; (2)

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^Magenta 1. 109, note 4; Mézières, pp. 377-8; Hutton, p. 154. On Sept. 4, 1362, the governing body of Venice declared that there never had been a moral philosopher or Christian poet to compare with Petrarch (Körtling, p. 362; Mézières, p. 378).

that Petrarch was at the summit of his reputation, an ambassador to the courts of kings, an adviser and exhorder of popes, sought out by princes,\(^5\) scholars, ecclesiastics, and poets of eminence; (3) that he was nearly 64 years old, and in failing health\(^6\); and (4) that Froissart was 30 years of age, and Chaucer still younger, young men with nothing but unconsidered trifles to recommend them,\(^7\) the works by which they are universally known lying still far in the future.


\(^6\) Körting, pp. 418, 437, 439, 442; cf. 405 ff. He wrote from a bed of pain (doloris in lectulo) on Jan. 13, 1368, between 4 and 5 o'clock in the morning (Körting, p. 418).

\(^7\) Hist. Background, p. 184; De Sade 3. 722.

How wide was the difference between Chaucer's and Petrarch's judgments of literature may be shown by one or two examples.

Chaucer alludes with respect in the House of Fame (566 ff.) to the Anticlaudianus of Alain de Lille, an author from whose Complaint of Nature (see Moffat's translation) he draws in Parl. of Fowls 316 ff. Petrarch, on the other hand, referring in his Apologia contra Galli Calumnius to Alain's Anticlaudianus and to Jean de Hauteville's (fl. 1184) Architrenius (printed in Wright's Anglo-Latin Satirical Poets and Epigrammatists of the Twelfth Century; cf. his Biog. Brit. Lit.: Anglo-Norman Period, pp. 250-256), says of the Architrenius: 'Of all that ever I read, nothing was ever more tedious than that Architrenius [wrongly printed as Architriuio]. . . . It gives the reader a nausea; it gives him a headache; it makes him laugh. . . . The Anticlaudianus is only a shade less wearisome than the Architrenius. Both these barbaric poets pour out floods of verbosity; both twist and struggle to no effect' (cf. Nolhac, Pétarque et l'Humanisme, 2d ed., 2. 226-7).

The best authorities assign Chaucer's translation (cf. Prol. L. G. IV. 255: 324) of the Roman de la Rose to his early manhood (Kittredge, Chaucer and his Poetry, p. 60; Legouis, Geoffrey Chaucer, p. 10; Root, The Poetry of Chaucer, p. 56; Skeat, Oxford Chaucer 1. lxxii; Wells, p. 650), and so much of it as he translated ('apparently entire,' Kittredge says) he had probably done before Lionel's journey. Of the Roman he must have known long passages by heart (Kittredge, p. 61) before he wrote the Book of the Duchess in 1369. Nothing more is necessary to prove how highly Chaucer regarded the poem at this time. What was Petrarch's estimate of it? Between 1360 and 1369 he addressed a poetical epistle to Guido Gonzaga, Lord of Mantua (Mantua domino), who had requested Petrarch to send him the foremost work of French literature. Petrarch thus characterizes the poem (translation condensed):

'How far Latin surpasses all other tongues, Greek perhaps excepted, you can learn from this little book, which France extols to the skies,
But there are other reasons which render an interview unlikely. In the first place, Petrarch, journeying from Padua, whence he

and compares with the greatest ever written. In it a certain Frenchman tells his dreams to the multitude—the demands \(\text{possit; al. possiti}\) of Jealousy and of Love, how fire feeds the passions of the young man, what sport is plied by the crone, with what arts of Venus the mad lover arms himself against the plagues that stand at the door, what are his distress and sorrow, what his rest knit up with labor, what his alternations (reading \text{vices}) of laughter and lament, how floods of tears bedew his infrequent joys. How could there be greater scope for poetic eloquence? Yet the poet, in the very act of telling his dream, is himself lost in a dream, and his waking can hardly be distinguished from sleep. How much better did Virgil set forth the passion of love in the death of Dido, and how superior are Catullus, Ovid, and Propertius, not to speak of other Italians, ancient and modern! Nevertheless, since you are bound to have something in an outlandish (\text{peregrina}) vernacular, do not despise this gift of mine, since France and Paris proclaim it their best.'

Cf. Nolhac 2. 228; 1. 165-172.

The little book (\text{libellus}) must mean only Guillaume de Lorris' part, one would think, for the following reasons: (1) the complete poem, a manuscript of over 22,000 lines (in the whole of Petrarch's Italian verse there are fewer than 10,000 lines, while his Latin epic, \text{Africa}, is now less than one-fourth as long as the \text{Roman}, and, even had it been completed to scale, would have been less than one-third as long), could hardly be described as a little book; (2) Petrarch mentions one author (\text{Gallius}), not two; (3) there is nothing in his description which cannot be accounted for by Lorris' fragment, since the old woman, though her part is developed at much greater length by Jean de Meun, is introduced by Lorris (ed. Michel, p. 130); (4) he would have been slow to despatch the work of so immoral and indecent a poet as Jean de Meun (cf. Langlois, in Petit de Julleville's \text{Hist. de la Langue et de la Litt. Fr.} 2. 149) to a friend, since he calls Ovid's \text{Art of Love} an 'insane work, deserving to have been the cause of his exile' (Nolhac 2. 179-180; Körting, p. 486); (5) the allusion to the \text{Roman} in Petrarch's \text{Trionfo della Castità} is clearly to the earlier part (Nolhac 2. 227-8).

That Petrarch had no very high opinion of English scholarship in 1337 is clear from his statement (\text{Fam.} 3. 1) that, being curious concerning the location of Thule, he had asked Richard de Bury about it (this was at Avignon, in 1330), who had promised to look the matter up in his books when he returned to England, but, though frequently reminded, had never answered a word; 'ita,' adds Petrarch, 'mihi Tyle amicitia Britannica nihil notior facta est.' A few years later, as he tells us in the same letter, Gerald de Barri's book, \text{The Wonders of Ireland}, fell into his hands, but the author, after citing the opinions of several earlier writers, confesses that he thinks the island mythical, or that it is far away in the
had not started till May 25,\(^8\) did not arrive till the 29th\(^9\) or 30th,\(^10\) two days after Lionel, and then at Pavia. Secondly, he was suffering about this time, and for six weeks after, from an injury to his shin, which kept him under the care of physicians.\(^{11}\) Thirdly, the chief purpose of his visit was not to attend the

Arctic Ocean. Not much more flattering is the view of English learning expressed by Boccaccio in his verses written on Petrarch's *Africa* (Corazzini, p. 250):

_Hispanus et Gallus, studiis tardusque Britannus._

\(^8\) *Sen.* II. 2.

\(^9\) So De Sade 3. 719; Fracassetti i. 187.

\(^{10}\) So Körting, p. 437; but Magenta (i. 133) says May 31. Petrarch's letter says: 'VI illuc die, hora tertia, perveni.' This would seem to indicate 9 o'clock, or earlier, on May 30.

\(^{11}\) Writing on July 21 to Francisco Bruni, he speaks of this affliction (*Sen.* II. 2): 'Illico rediturus fueram, non obstante tibiae collisione, qua in parte corporis a pueritia parum felix fui, et qua me tum sepe olim, tum per hos dies complusculos afflxit, invisasque [Petrarch had no opinion of doctors] inter medicorum manus usque nunc detinet.' This was not the first time he had suffered from an injury to his left leg. In 1350, when he was traveling to Rome for the fifth time, the horse of one of his companions, an old abbot, came up on his left side, and, lashing out with his heels at Petrarch's horse, struck the poet instead, just below the knee. This happened between Bolseno and Viterbo, and it took him three days more to go from Viterbo to Rome (54 miles). The bruise festered, and when he wrote to Boccaccio on Nov. 2, he had already been in bed with it fourteen days, which seemed to him fourteen years, since his mind grew torpid when he could not stir about (*Fam.* II. 1.) In 1359 a stranger incident befell him. He had a large volume of Cicero's letters, copied by his own hand some time before. This he kept on a shelf just beside the door of his library. On this particular occasion, as he entered the room, a flap of his garment caught on the book, and brought it down on the same left leg, this time just above the heel; the next day the same thing occurred again, and it was not till the book had fallen a third and a fourth time that he changed its place. Petrarch went about his affairs as usual, hoping the bruise would heal, but again it festered, and he had to submit to fasting, frequent fomentations, and absolute repose. He adds: 'It seems as though my many pains and aches had always, since my childhood, fastened upon this unfortunate left leg, and now it forces me to stay in bed, which I detest' (*Fam.* 21. 10). This was written on Oct. 15, but the accident must have occurred much earlier, for on Aug. 18 of the next year (1360) he writes from Milan to Boccaccio that a year after the mischance, finding things grow from bad to worse, he had dismissed the doctors and taken matters into his own hands; he had never suffered so much in his life, he says, but was now slowly recovering.
wedding, but to comply with the solicitations of Galeazzo, who had been urging him to confer with the Cardinal Anglicus de Grimoard, brother of Urban V, with reference to composing the strife between the Pope and the Visconti. Fourthly, on the

(Var. 25; Fracassetti 5. 301-2). Whether this leg suffered in his flight from Parma in 1345, when his right arm was injured, we do not know (cf. Fracassetti 4. 374). In any case, Novati (F. Petrarca e la Lombardia, p. 40) is convinced that it was an old wound, never entirely healed, and now aggravated by the long horseback ride, that was troubling him in 1368; but he supposes that it was received in the flight from Parma, apparently knowing nothing of the certain injuries.

Novati (p. 49) exclaims: ‘Behold him here amid the uproar of the wedding festival, under the necessity of taking part in interminable ceremonies, and of being present at no less interminable banquets. . . . Who can tell what Messer Francesco was thinking of, as all this Panteogruelian feast unrolled itself before his eyes?’

Levati, Viaggi di Francesco Petrarca 5. 293-6; De Sade, pp. 718-9; Fracassetti 2. 240, 251; Körting, p. 437; Novati, p. 49; R. I. S. 15. 480-490; 17. 911. Cf. Petrarch, Sen. 11. 2:

‘Scito igitur, me hinc [from Padua] . . . abiisse, magnis enim precibus et repetitis literis Ticinum [Pavia] iterum atque iterum evocabar, et quamvis naturae meae infesta aestas adventaret, meque hinc quietis amor stringeret, illinc status præsens et suspectum latrun-culis dettereret iter, vigente tamen hinc ingrati metu, honestique inde specie animum attrahente, quod scilicet ad tractatum tante pacis evocatum me sentire, si fortassis ulla ex parte bono publico utilis esse possem, parui,’ etc.

It must be remembered, however, that Petrarch had spent the summers of 1363-7 at Pavia (Fracassetti i. 185; 2. 240; 5. 490; Sen. 5. 1; Hutton, pp. 209-210; cf. Körting, p. 404; according to Boccaccio’s letter, quoted below, he must have been there in 1367 from ca. March 24 to ca. June 30; cf. Corazzini, pp. 123, 129), where his daughter and son-in-law (for Petrarch’s attachment to him, see Sen. 5. 7; 10. 4) must have been residing at least temporarily, in 1368, since they regularly formed a part of his household as long as he lived (Rossetti, App. 3, p. 66; Mézières, p. 163; Bœdeker, Oberitalien, 18th ed., Leipzig, 1911, p. 199; Magenta i. 109); after 1368 he never returned (Giulini 5. 517). That he was fond of the place is shown by his famous letter to Boccaccio (Sen. 5. 1, written in 1365), a part of which I quote from the translation by Robinson and Rolfe (Petrarch, pp. 323-5):

‘You would find the air of the place very salubrious. I have now spent three summers here, and I do not remember to have experienced ever anywhere else such frequent and plentiful showers with so little thunder and lightning, such freedom from heat, and such steady, refreshing breezes. You would find the city beautifully situ-
very day\textsuperscript{14} of Lionel's wedding, Petrarch's little grandson\textsuperscript{15} died

Commandingly situated on a slight elevation, and on the margin of gently sloping banks, it raises its crown of towers into the clouds, and enjoys a wide and free prospect on all sides, one which, so far as I know, is not exceeded in extent or beauty by that of any town which lies thus in a plain. By turning one's head ever so little, one can see in one direction the snowy crest of the Alps, and in the other the wooded Apennines. . . . Lastly, in order of time, though not of importance, you would see the huge palace, situated on the highest point of the city; an admirable building, which cost a vast amount. It was built by the princely Galeazzo, the younger of the Visconti, the rulers of Milan, Pavia, and many neighboring towns, a man who surpasses others in many ways, and in the magnificence of his buildings fairly excels himself. I am convinced, unless I be misled by my partiality for the founder, that, with your good taste in such matters, you would declare this to be the most noble production of modern art. . . . I leave here shortly, but very gladly return to pass the summer months—if fate grant me more summer months.'

\textsuperscript{14} So Corio, p. 471: 'In questo di medesimo, in Pavia morì,' etc.; cf. Giuliani 5, 516; Fracassetti 2, 262; Mézières, p. 164. The date of May 19 (XIV Kal. Jun.; others read XIII) is rejected by Körting (p. 365, note 3), though, following Corio, he assigns June 15, instead of June 5 (the nones of June), as the date of the wedding.

\textsuperscript{15} Corio says son (\textit{fanciullo}), though the Francesca whom he names as the mother was certainly Petrarch's natural daughter, probably born in 1343 (\textit{Encyc. Brit.}, 11th ed., 21, 311; Körting, p. 143) and married in Milan to Franceschino d'Amicolo da Brossano (called Borsano by Corio, and see below; Hutton, p. 213: 'Franceschino da Brossano di Amicolo'; Rossetti, p. 66: 'Franceschino Amicolo da Brossano'; Fracassetti 2, 260: 'Franceschino d'Amicolo di Brossano della Porta Vercellina'; Petrarch's will: 'Franciscolum de Borsano, filium quondam domini Amicoli de Borsano, civem Mediolani Portæ Vercelinae') in 1361 (Körting, p. 365; Rossetti, App. 3, p. 66). A daughter, Eletta, must have been born to them in 1362 or 1363, since Boccaccio, writing to Petrarch on June 30, 1367, of his visit to the little family in Venice, after he had praised the charm of the father and mother, goes on (Hutton, pp. 213-4; cf. Corazzini, p. 124):

'Presently we were talking in your pleasant little garden with some friends, and she offered me with matronly serenity your house, your books, and all your things there. Suddenly little footsteps—and there came towards us thy Eletta, my delight, who, without knowing who I was, looked at me smiling. I was not only delighted, I greedily took her in my arms, imagining that I held my little one (\textit{virgunculam olim meam}) that is lost to me. What shall I say? If you do not believe me, you will believe Guglielmo da Ravenna, the physician, and
in Pavia, a circumstance which filled him with unspeakable sorrow.

our Donato, who knew her. Your little one has the same aspect that she had who was my Eletta, the same expression, the same light in the eyes, the same laughter there, the same gestures, the same way of walking, the same way of carrying all her little person; only my Eletta was, it is true, a little taller when at the age of five and a half I saw her for the last time. Besides, she talks in the same way, uses the same words, and has the same simplicity. Indeed, indeed, there is no difference save that thy little one is golden-haired, while mine had chestnut tresses (‘ aurea cesaries tue est, meae inter nigrum rufanque fuit’). Ah me! how many times when I have held thine in my arms, listening to her prattle, the memory of my baby stolen away from me has brought tears to my eyes—which I let no one see.’

Hutton proceeds to comment: 'It is perhaps in that letter we see Boccaccio better than in any other of his writings; the greatest man then in Italy playing with a little child, obliged in his poverty to accept assistance from one who was almost a stranger' [Franceschino had pressed upon him a considerable gift at parting].

Students of the Middle English poem, The Pearl (see Osgood’s edition), will not need to be reminded of Boccaccio’s Elegy XIV (about 1360, according to Osgood), with its vision of his little daughter (d. 1355; see Hecker, Boccaccio-Funde, p. 84), Violante (there called Olympia, but here, in compliment to Petrarch, designated as ‘my Eletta’).

By February, 1366, another child, this time a son, was born to the pair. This happened at Venice, according to Körting (p. 365), Fracassetti (2. 249), and Mérières (p. 164). His epitaph, however, calls him ‘Mediolanensis,’ and to this there seems no objection, since Petrarch was accustomed to pass the summers of 1363-7 at Pavia (see p. 79), and we know, according to Sen. 9. 2, that he— and therefore probably his daughter (see p. 79)—was in the country near Milan on Nov. 1, 1366, and do not know of his presence at Venice (Sen. 6. 1) in that year later than Jan. 25, while he had been at Padua (Sen. 5. 1) as late as Dec. 14, 1365. The child was christened Francesco, a name suggestive at once of his father, mother, and grandfather. Petrarch’s son, Giovanni, who had been a great disappointment to him, had died of the plague in 1361, so that all his domestic affections were concentrated on his daughter’s family. This is clear from the letter (Sen. 10. 4) written after the grandson’s death. In this he declares that the child was dearer to him than if it had been his own, since it was born of two whom he so greatly loved, and that he doubted whether he had ever loved anything more. Hardly was the babe a year old before friends remarked on its resemblance to Petrarch. It was a melancholy satisfaction to the poet that Galeazzo, who had seen the death of his own infant with dry eyes but a short time before, could scarcely even hear of the death of the little Francesco without tears. Petrarch
Petrarch arrived at Pavia, then, where he was doubtless the guest of Galeazzo at the Castle, two or three days after had, he tells his friend, erected at Pavia a marble memorial to the child on which six elegiac distichs of his own composition were inscribed in golden letters—a thing which he would hardly have done, he says, for any one else (‘Bustum ego marmoreum illi infantulo, apud Ticini urbem, bis sex elegis inscriptum, literisque aureis exaratum statui, quod vix alteri facerem, et mihi ab altero fieri nollem. . . . Hoc ultimum et inane tribuerim obsequii genus; et si non sibi utile, gratum mihi, hoc illi igitur sacrum volui, non causam lachrymis, ut Maro ait, sed memoriae, non tam meae, cui nec saxo nec carmine opus erat, quam eorum quos illuc casus attulerit, ut sciant quantam ille suis ab ipso vita principio charus fuit’).

These lines have fortunately been preserved. The memorial was erected in the church of San Zeno (one of the 101 churches standing in 1320 within the walls of Pavia, a city which now boasts something like 30,000 inhabitants; see Rec. Ital. Script. ii. 9), which was suppressed in 1789. Thence it found its way to the collection of Marquis Luigi Malaspina di Samnazzaro (Fracassetti 2. 262), who published the verses (p. 43) in his collection of lapidary inscriptions (Iscrizioni Lapidarie, in two parts, Milan, 1830-32, folio; cf. Giovanni Voghera, Tav. XIII of his Antichità Pavesi, Fasc. i-16, Pavia, 1827, folio), and is now preserved on the wall of the staircase of the Museo Civico, which was formerly the Palazzo Malaspina (Baedeker, Oberitalien, 18th ed., Leipzig, 1911, p. 199; but G. Natali, Pavia, pp. 130 ff., says that the Palazzo Malaspina is on the site of San Zeno, and next door to the Museo Civico), in the immediate vicinity of the former church (there is a Vicolo San Zeno near, with a bust of Boethius, on the spot where his prison is supposed to have stood). The date is ‘MCCCLXVIII, XIV. Kal. Iunias, hora IX’ (Fracassetti 2. 262), and the child is described as ‘pulcher et innocens.’ The inscription is in a square Gothic character. A copy of the verses, in Roman letters, is also to be found, without the date, in the lower cloister of the Cathedral of Treviso, where Francesca, the child’s mother, died on Aug. 2, 1382 (Poesie Minori, p. 67). There are slight differences between the two inscriptions, that at Treviso having been evidently made from the earlier one at Pavia. The Pavian copy follows (from Rossetti, App. 1, Epigrapha 4; see also Mézières, pp. 166-7; Fracassetti 2. 262; De Sade, pp. 723-4; Magenta i. 133, note 2), with the variants of the Trevisan:

Vix mundi novus hospes iter [eram], vitaeque volants
Attigeram tenero limina dura pede,
Franciscus genitor, genetrix Francisca; secutus
Hos, de fonte sacro nomen idem tenui.
Infans formosus, solamen dulce parentum,
Nunc [Hinc] dolor; hoc uno sors mea laeta minus:
Caetera sum felix, et Vere gaudia vitae
Nactus et æternæ, tam cito, tam facile.
Lionel and his retinue had arrived at Milan. At Pavia he would have had every reason for staying until (say) June 4, when he would almost necessarily have arrived at Milan, against the wedding of the following day. Among these reasons would have been his dislike of summer heat, his love of quiet, his general predilection for Pavia, the condition of his leg, his desire to be with his daughter’s family as much as possible, his occupation with Galeazzo’s affairs (Galeazzo’s seat was primarily Pavia, as Bernabò’s was Milan), and very possibly also the illness of the little Francesco, whom we need not assume to have died on the very day he fell sick. We may suppose him to have planned to return on June 6 from Milan to Pavia, for most of the reasons which have been detailed, and not least that he might be with his daughter and her husband in their sorrow, and assist in the preparations for the funeral. This, however, was not to be (see p. 85). In fact, we know that it was nearly a month before he could leave Milan. Writing from Pavia to Giovanni da Mandello on July 6, he tells his correspondent that he had left Milan on July 4, though he had not yet recovered, because he wished to escape from the noise and confusion, but that the horseback ride to Pavia had again aggravated his sore. He is

Sol bis, Luna quater, flexum peragraverat orbem,
Obvia mors, fallor, obvia vita fuit.
Me Venetum terris dedit urbs, rapuitque Papia;
Nec queror, hinc [hic] cælo restituendus eram.

This may be translated:

‘A newly arrived guest of the world, I was but just beginning my journey, and had scarcely touched with my tender feet the rough threshold of the life that hastens away. My father was Francis, and Frances my mother; from them did I receive my name at the baptismal font. I was a beautiful child, the lovely solace of my parents, but now their grief. On this account alone is my lot less joyous, since for the rest I am happy, having attained thus early and easily the joys of the true life, the life eternal. Twice had the sun measured the orbit of the world, and four times the moon, when death—nay, rather life—stood before me. Venice gave me to the earth, and now Pavia has snatched me away; but I mourn not, since it was fitting that from here I should be restored to heaven.’

16 See p. 79.
17 See p. 79.
18 See pp. 79-80.
19 See pp. 78-9.
hardly able to rise from bed, he says, and then is all of a tremor. On his journey by boat, with Venice as his destination, he hopes to see the Emperor (Charles IV), who had permitted him to come, and now commands him to return.\textsuperscript{29}

Petrarch talks of returning to Venice, but he actually proceeded to Padua, arriving there on July 19.\textsuperscript{21} On July 21 he wrote\textsuperscript{21} that he would have returned much sooner, notwithstanding the injury to his leg, had it not been that the land-route (by which he had almost certainly come; cf. Novati, p. 49) had been rendered impracticable by the prevailing military activities, and that he had the utmost difficulty in persuading a boatman to convey him down the Po for love or money,\textsuperscript{22} over a month having been passed in this quest\textsuperscript{23} and in overcoming a variety of obstacles.\textsuperscript{24}

Thus, ignoring the age and eminence of Petrarch, and the youth and comparative obscurity of Froissart and Chaucer,\textsuperscript{25} and ignoring the fact that neither Froissart nor Chaucer alludes

\textsuperscript{29} Novati, pp. 61-3, quotes the letter in full from which the subjoined extracts are taken: 'Tibia sinistra, vetus hostis mea, per hos me dies exercuit et in lectulo detinuit, unde vix adhuc tremebundus assurgo. . . . Nondum nempe convalui; nam strepitum licet ac tumultum confusionemque multiplicem perosus, majore nudiustertius urbe dimissa, in hunc cupide quasi portum ex procellis commigraverim, ulcus tamen meum illud equitando recruduit. . . . Mox Venetias, unde nuper abii, secundo alveo reversurus sum, salutato interim Imperatore, nisi castra permoverit procul a Padi ripa. Illo enim permittente veni, illo jubente redeo, hiis Ligurum dominisque utrumque probantibus.' Since we know that the Emperor was at Bologna on July 14 and 15 (\textit{R. I. S.} 18, 181), and since Petrarch, after his return to Padua, says nothing of having met him, it is fairly probable that he did not.

\textsuperscript{21} \textit{Sen.} ii. 2; see p. 78.

\textsuperscript{22} 'Ulla prece vel pretio.'

\textsuperscript{23} Mense ibi integro, et amplius, inter navis inquisitionem et difficultates rerum varias absumpto.'

\textsuperscript{24} Petrarch's main fear, he tells us, was of chance robbers, for his love of peace was so well known to both parties that he felt he had no danger to apprehend from the regular combatants. His friends endeavored to dissuade him from what they considered his insanity, but he persevered, and finally found a boatman who was reassured by his calmness. The river was full of armed boats, and the shores were lined with armed bands; but, while any one else would have been captured, killed, or at least robbed, his vessel was loaded with wine, game, fruit, and spices by the generosity of those who intercepted him, and his progress was only delayed by their friendly assiduities.

\textsuperscript{25} In Petrarch's eyes a 'barbarian'; see pp. 23, 77.
Petrarch at the Banquet

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to such a meeting, we see that there are reasons enough in the bodily infirmity of Petrarch, and his preoccupation with state-affairs, to render such a meeting unlikely. Moreover, as he went straight to Pavia from Padua, did not arrive till May 30, presumably had no occasion to be in Milan till the eve of the wedding (while Lionel’s retinue had arrived on May 27), must have watched over a sick-bed up to the moment of his departure for Milan, and thenceforth, as soon as the wedding-day was over, lay languishing with his festering wound until July 4, unable to return to Pavia, the probability of a meeting between Petrarch and the two young versifiers would seem to be excluded. And had they met, it would have been the meeting of a grave and aging student with sentimental and somewhat conventional rhymesters, of the companion and idol of princes with a yeoman of the king’s household, and an amuser of noble leisures by rather tinkling minstrelsy, dependent for his livelihood upon chance doles and irregular patronage.26 If Lionel’s followers were admitted into the courtyard of the Broletto, and allowed to see the noble company at their magnificent feast, then, from afar off, Froissart and Chaucer may have had sight of Petrarch; but a closer acquaintance than this is against all the probabilities.

26 In the Buisson de Jonccele (230-369) he gives a list of his benefactors and benefactresses, among whom were Philippa of England; Blanche of Lancaster; the Lord and Lady of Coucy; Edward III (100 florins); the Earl of Hereford; Edward Despenser; the Duke of Bourbon; Charles V; the Duke and Duchess of Brabant; Pierre I, King of Cyprus (40 ducats); David Bruce; the Earl of Douglas; etc. Notable, in this connection, is his mention of the Green Count (339-347):

Amé, le conte de Savoie,
Je ne sçai se nommé l’avoie,
Mès à Melans, en Lombardie,
Une bonne cote hardie
Me donna de x. florins d’or;
Il m’en souvient mout bien encor,
Pour un tant que mout me valirent;
Car onques c’ils ne me fallirent
Jusqu'à tant que je vinc à Romme.

In 1366 he received a gift of six golden muttons, when a great concourse of minstrels came together at Brussels: ‘uni Fritsardo, dictorì qui est cum regina Angliæ, dicto die, VI mottones.’ A year or so after Queen Philippa’s death, he is glad to receive 16 francs (the franc then had the intrinsic value of 13.38 modern francs) from the Duchess of Brabant (‘uni Fristardo dictatori’) for a new book in French.
IX. LIONEL'S REMAINING LIFE

The Milanese annalist tells us that Lionel, after the consummation of the marriage, remained in Milan for some days, and then left for Alba. The chronicles of Saluzzo and Montferrat agree in stating that after the wedding Violante left for Pavia, while Lionel, with his retinue, betook himself to Alba. Before he had finished what he had to do there, he fell sick, and returned to Pavia, where he spent a few days. Thereupon he went back to Alba, and there died.\(^1\) We have, in all, four months and twelve days to account for between his marriage (June 5) and his death (Oct. 17). As he was able to take part in a tourney on Aug. 16,\(^2\) it is probable that he did not return to Pavia before that time; and as his will was made on Oct. 3, he must have been ill before then. With respect to the cause of his malady, Jovius\(^3\) ascribes it to excessive feasting in a country where he was not yet acclimated, and intimates that while this was in

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\(^1\) Petrus Azarius (quoted by Benvenuto) concurs with these two chroniclers in saying that Lionel left Violante at Pavia—where she would naturally be most at home. In the next sentence there seems to be a corruption, for it runs: 'Nec umquam praedictus dominus Leonotus praedictis paracis Papiam redivit, sed, parva mora in Pedemontio protracta, Albam reversus diei clausit extremum.' But how could Lionel, after delaying a short time in Piedmont, return to Alba, seeing that Alba was itself in Piedmont? Perhaps the 'nec umquam' should be construed with 'paracis,' for Cron. Saluz. has: 'Ancora non habiendo finito le cosse soe [Cron. Monf.: le cose predette], se amalo e ritorna a Pavia' (similarly Cron. Monf.). On this supposition, we might translate Azarius: 'Lionel, though he had never finished up the matters referred to above [but they were not referred to], returned to Pavia; but, making only a short stay here [reading Papia for Pedemontio], he went back to Alba.' This would then agree with the chronicles of Saluzzo and Montferrat, which evidently deserve our confidence.

\(^2\) See p. 88.

\(^3\) He writes: 'Sed non multo post Leonatus quam novae nuptae operam daret, intempestivisque conviviis ad patrii moris disciplinam, alieni cali ignarus, intemperantis uteretur, ad Albam morbo consumptus interiit.' Thus translated by Stow: 'But not long after, Leonel living with his new wife, whilst after the manner of his owne Countrey, as forgetting or not regarding his change of ayre, hee addicted himselfe overmuch to untimely banquettings, spent and consumed with a lingering sickness, dyed at Alba.'
Lionel's Remaining Life

progress he was living with Violante. However, his feasting in Milan can hardly have been the cause of his death; and, while there may have been banqueting at the Castle after his return from Alba, it must be remembered that he was ill before this return, that his illness seems to have been the cause of the return, and that in any case he stayed at Pavia but a few days. On the whole, it seems most reasonable to assume that he saw but little of Violante during their married life, being called away by the care of his province; that the sickness which caused his death was of no very long duration, and yet not excessively sudden in its operation; and that his return to Pavia would therefore naturally have fallen in September, perhaps late in the month. As the lingering illness which terminated in the death of the Black Prince seems to have originated in digestive disorders contracted during his sojourn in Spain, it is not unreasonable to assume that Lionel may have indulged overmuch in eating and drinking—consider his wedding-banquet!—and that the heat of a Piedmontese summer, his military exercises, and the labors and perplexities incident to his rule amid an alien people, and surrounded by open or secret enemies, are responsible for the rest, or would even have been sufficient of themselves. As for feasting, he does not seem to have been prostrated by that at Paris or at Chambéry; but in both these places the weather must have been cooler, and Lionel had then nothing to do but give himself up to the pleasure of the moment.  

4Knighton (2. 123; cf. Chron. Angliae 61) affirms that his death was due to poison (‘intoxicatus veneno interiit’), but then Knighton knows Galeazzo as Golias (‘filiam Goliae’)—hardly a compliment, by the way—and calls Milan ‘Meletum.’ Moreover, his statement is contradicted by those of the Italian chroniclers, for Petrus Azarius and Cron. Monf. say that Galeazzo and all the Lombards lamented greatly over Lionel’s death; and Annal. Med. that Galeazzo was beside himself (‘effectus est velut demons’) with excessive grief. This grief was natural enough, considering the hopes that Galeazzo had built upon this marriage, and the disorders which immediately followed (see below, pp. 104 ff.). Hardyng confirms, on the whole, the statements of Jovius and the chronicles (p. 334):

In whiche meane tyme his justes & his excesse,  
His great riot and wynes delicacie,  
His ghoste exiled out [of his corps] doutlesse,  
Afore the daye set of his regence,  
For whom was made great mone through Italie.
Of the adventures in which Lionel may have been engaged between his marriage and his death, we catch sight of only one. A branch of the house of Savoy had acquired what proved to be the merely nominal title of Princes of Achaia, through the marriage of Filippo of Savoy to Isabella of Villehardoun^5 (her third marriage) on Feb. 13, 1301, she having by her second marriage become the mother of Mahault of Hainaut.^6 From this Filippo descended Filippo II, who succeeded to the Piedmontese dominions of his father Giacomo on May 7, 1367, though the latter, having regard to his evil conduct, had left the principality to his younger son, Amedeo, to whom Filippo was to do homage.^7 On March 17, 1368, Filippo made formal claim to the principality,^8 his brother being then, and until 1377, under the guardianship of the Green Count, Amedeo VI of Savoy. Strife having arisen between the two parties, Filippo challenged the Green Count to a tournament near Saluzzo, where, on a specified day, fifty were to encounter fifty. The Green Count, with Lionel, Giovanni II of Montferrat (ruled 1338-1372), and certain men sent by Galeazzo, arrived at Fossano on the day appointed, probably Aug. 16; but the craven Filippo repudiated his engagement,

For Hardyng's 'wynes' we should perhaps read 'wyues,' i.e. 'wife's' (cf. Jovius); then 'delicacie' would mean voluptuousness. His 'regence' refers to the extravagant statement with which he had ended a previous stanza:

In citees all he helde well vnitees,
Greate justes ay and joyus tournementes,
Of lordes & knightes he made great assemblees
Through all the lande by his wyse regimentes;
They purposed hole by theyr commen assentes
To crowne hym kyng of all [great Italie,]
Within halfe a yere for his good gouernaly.

On an earlier page Hardyng had said:

And all the rule he had by counsell wyse,
Fro mount Godard vnto the citee [of] Florence,
And well beloved was for his sapience.

Barnes seems to go back to Froissart (see p. 104): 'Not without suspicion of being poisoned, by some subtle Italian trick, to prevent that Glory, which perhaps some Envy'd, that he should attain.'

^6 See Rodd 2. 39-58.
^6 See pp. 124-5.
^7 Cron. Saluz., p. 1014.
^8 Ib., p. 1012.
whereupon, after some fine skirmishes, Amedeo VI and his company went to Savigliano to pass the night, and thereupon each division went home. Filippo, being judicially condemned in December of that year, was publicly drowned in one of the three small lakes near Avigliana, by order of Amedeo (Cron. Saluz.), while his brother ruled till 1402. So we see Lionel, having left Alba in the August heats, repairing on horseback to Savigliano, and thence to Fossano, on Aug. 15, to pitch camp against the following day; from Fossano returning to Savigliano for the night, and so back to Fossano, arrayed in armor for the tourneying, and once more, after the fruitless preparations, going back to lodge at Savigliano.

9 The two authorities are the chronicles of Savoy and Saluzzo. The former runs (M. H. P. 3 (Script. 1), 320-321):

'En sousi furent messire Philippe de Savoye et le marquis Frederich de Saluces quant sentirent venir le conte contre euls, car ilz navoyent que pou de gens darmes, et, pour rompre la chevauchie du conte, messire Philippe luy manda ung herault, disant que si osoit combattre sa querelle luy cinquante hommes darmes, que luy a tout autres cinquante le combateroit corps a corps en la galle [valle?] entre Saluces et Escarnefis a un jour qui nomma. Entendant le conte les paroles du herault, respondit: 'Vatant a ton maistre, et luy dist que a layde de Dieu je seray au lieu et en la place au jour que tu dis, accompagnie moy cinquantieme de hommes darmes pour combatter corps a corps noz querelles.' A celle responce sen tourna le herault; et le conte, accompagnne du due de Clerance, du marquis de Monferra, et des gens de messire Galliache, ensemble les cinquante hommes darmes, vindrent devant Fossan, en requirant que le gage se tenist entreulx comme il estoit ordonne. Mais messire Philippe refusa la bataille et la promesse qui avoit faitte; le refus estre fait, eut la de belles escarmuches, qui durerent tout le jour de deux pars, et vers la nuyt le conte et sa compagnie se partirent de devant Fossan, et se alla logier a Savillian, et le due de Clerance, le marquis de Monferra, et les gens de messire Galliace se retrayrent en leur pays. Et apres ne demoura guere que messire Philippe de Savoye fut mort, dont le pays de Piemont resta en grant pacificacion.'

The latter is as follows (M. H. P., pp. 1014-5):

'A 15 di Augusto esso Conte Ame dy Savoya cum exercito, una cum el Marchexe dy Monferrato e la gente soa, e missere Lioneto dy Angleterra (el quale ancora non era morto, ma mory quello anno), andorono a Saviglano, poy de ly a Fosano, per piantarly el campo. Pur tornorono quello giorno medemo a Saviglano, cum lo exercito loro. Poy, il giorno da presso, tornorono tuty a Fosano, dove era el signor Philipo, fratello del Principe dy Achaya.'
This meeting with Filippo at Fossano was not the first time that Lionel encountered him. While the duke was at Pavia or Milan, we are not certain which, but probably the former,\(^9\) he had heard Filippo called traitor and felon by the Green Count in the presence of himself and Galeazzo. Amedeo having demanded justice against Filippo, Lionel personally arrested the latter, and cited him to appear before his tribunal on May 30. Here he seems to have pronounced a decision unfavorable to Filippo, who thereupon announced his intention of appealing to the parliament—if so it may be called—which was to be held at Rivoli,\(^11\) and thereupon returned.\(^12\) It is somewhat curious that even a purely nominal lord of Clarentza, in Greece, should be cited before the tribunal of a Duke of Clarence, his feudal superior, in Italy, considering that this Duke of Clarence was a royal prince of England.\(^13\)

**X. LIONEL'S DEATH AND BURIAL**

The date of Lionel's death was certainly Oct. 17,\(^1\) 1368, though even the *Dictionary of National Biography* has it wrong.\(^2\)

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\(^9\)Since Lionel would hardly have cited him on May 27, or later, to a tribunal held on May 30. *Cron. Saluz.* (p. 1013) says that Filippo and his brother went to Milan and Pavia in April, but, as it adds that they made many demands on the one side and the other, and were finally reconciled by Galeazzo, it is possible that they may have remained in those parts till toward the end of May.

\(^11\)See p. 43.

\(^12\)Gabotto, in *Misc. di Stor. Ital.* 33. 169.

\(^13\)Cf. pp. 122 ff.

\(^1\)The *Inquisitio post Mortem* (43 Edw. III, File 208, No. 23, Public Record Office), dated July 12, 1369, says, under the county of Somerset: 'Dicunt [the jurors] quod idem Dux obiit decimo septimo die Octobris, anno regni Regis nunc Anglie quadragesimo secundo’ (adding that his daughter Philippa was 13 years old on Aug. 16, 1368); under the county of Essex: 'Dicunt quod idem Dux obiit xvii die Octobris ultimo elapsi’ (similarly as to Philippa). In the *Annals of Ireland* (*Chartularies of St. Mary's Abbey, Dublin*, ed. Gilbert, 2. 397) we read: ‘In vigilia Sancti Luce Evangeliste, Dominus Leonellus, Dux Clarencie, obiit apud Albe in Pymond.’ Walsingham has (i. 306): ‘circa festum Nativitatis Beatae Marie,’ i. e., Sept. 8. *Cron. Monf.* has Oct. 15.

\(^2\)Correctly given in Dugdale, *Baronage* 2. 167-8; Barnes; Sandford, p. 223.
As to the disposition of Lionel's body authorities differ. According to Froissart, it was embalmed, and sent home to England by Galeazzo. The *Annals of Ireland* (as above) declare that he was first buried in the church of S. Pietro Ciel d'Oro in Pavia, and afterwards in the Augustinian monastery of Clare, in Suffolk. On the other hand, Capgrave relates that Lionel, when dying, ordered his attendants to convey his heart and bones to Clare, and to bury the rest of his body (*carnibus suis cum visceribus*) in front of the tomb of St. Augustine, where Henry, Earl of Derby, saw his resting-place.

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3 Kervyn 7. 251-2.
4 So also *Annal. Med.* (R. I. S. 16. 740); cf. Kervyn 7. 251: 'Touttesfois messires Galés envoyé le corps embaumné de monseigneur Lion, due de Clarencse, par un evesque, arrière en Angleterre; là fu-il enseveli.' The *Chron. Plac.* makes the astonishing statement that his body was in that year carried to Apulia (R. I. S. 16. 510).
5 'Primo sepultus in civitate Papic juxta Sanctum Augustinum Doctorem [see *Hist. Background*, p. 195], deinde sepeltur apud Clare, in conventu Augustinensium in Anglia.'
6 Petrus Azarius, as quoted by Benvenuto: 'Et ipso mortuo in Papia [sic] portato, Papiae traditus fuit sepulture'; *Cron. Salus.*: 'fu portato a Pavia.'
7 So Beltz, *Mem. of the Order of the Garter*, p. 131; Sandford, p. 223 (copied by Rapin, *Hist. of England*, 1743, i. 439; cf. Nichols, *Wills*, 1780, p. 91). Sandford seems indebted to Barnes, p. 720: 'Tho for the present he was deposited in the Chief Church of Pavia, a City of Milan, yet soon after, according to his Testament, his Body was brought over into England by Thomas Newborne Esquire [whom Barnes makes one of his legatees], and others of his Domesticks, and interred in the said Church of the Augustine-Fryars, at Clare aforesaid, near unto the Body of his First Wife, Elizabeth de Burgh.'
9 *De Illustribus Herculcis*, quoted in *Derby Accounts*, p. cxi; so Kervyn 21. 2, 3.
10 Professor Tout, speaking of Edmund Mortimer, third Earl of March, remarks (*Dict. Nat. Biog.* 39. 121): 'According to the directions in his will, March's body was interred on the left hand of the high altar of Wigmore Abbey (Nichols, p. 104). An Irish chronicle speaks of his being buried in the church of the Holy Trinity at Cork, but this probably only refers to the more perishable part of his body.'
in 1393\(^{11}\); but there is nothing of this in his will,\(^{12}\) which orders that his body shall be buried before the high altar in the choir of the abbey church at Clare. Galeotto del Carretto,\(^{13}\) the

\(^{11}\) The remains of Augustine were, according to tradition, carried in 496 from Hippo to Sardinia, and thence removed by Liutprand to Pavia in 723. The beautiful shrine which stands behind the high altar, and bears the date of 1362, was probably executed between 1360 and 1380, and therefore was not completed at Lionel’s death in 1368 (Natali, Pavia e la sua Certosa. Pavia, 1911, pp. 34-5; Le Chiese di Pavia, Part I (in the series entitled L’Italia Monumentale). Milan, 1913, pp. 35-9; cf. Venturi, Storia dell’Arte 4. 592-605). In Magenta (p. 164), where, as in the preceding, the shrine is represented, there is a fuller account of its history. Magenta declares that the shrine was begun on Dec. 14, 1362, that the foundation was laid in the sacristy of the church, and that it was completed in 1370. It remained in the sacristy at least till after 1461, at which time the bones of the saint were reputed to lie in a chapel of the crypt; they were, however, not rediscovered till 1605 (op. cit., pp. 163-4). It is therefore no doubt in the crypt that the earlier resting-place of Lionel’s remains is to be sought, if we assume that Capgrave is to be believed (but cf. p. 95).

As the resting-place of Boethius (see the picture of the tower where he is supposed to have been imprisoned, in Magenta 1. 162), S. Pietro in Ciel d’Oro was celebrated by Dante (Par. 10. 127-9), where he speaks of the philosopher’s soul:

\begin{quote}
Lo corpo ond’ ella fu cacciata giace
Giuso in Ciel d’oro, ed essa da martiro
E da esilio venne a questa pace.
\end{quote}

(‘The body whence it was chased forth lieth down below in Ciel d’Oro, and itself from martyrdom and exile came unto this peace.’)

In a famous letter of Petrarch’s to Boccaccio, written probably in 1365 (cf. p. 79), he thus refers to S. Pietro: ‘You would have seen where St. Augustine is buried, and where Boethius found a fitting place of exile in which to spend his old age and to die. They now repose together in two urns, under the same roof with King Liutprand, who transferred the body of St. Augustine from Sardinia to this city. This is indeed a pious and devout concourse of illustrious men.’ Boccaccio also refers to the church (Dec. 10. 9). An Augustinian monastery was erected at the right of the church in 1327 (Natali, p. 33).

\(^{12}\) Though Kervyn says otherwise (21. 2-3).

\(^{13}\) M. H. P., p. 1312: ‘De la cui morte Galeatio e tutti gli Lombardi molto se dolsero, et portato morto in Pavia cum infinite spese, et in parte mandato in la patria, fu sepelito in Pavia.’ Magenta (p. 135) says expressly: ‘Mori il 15 [but see above, p. 90] ottobre del 1368, gettando in un profondo duolo la nostra Corte, che diede alle ceneri di lui sepoltura nella basilica di S. Pietro in Ciel d’Oro.’
medieval chronicler of Montferrat, confirms the statement of Capgrave. What is certain is that the whole, or some part, of his body was buried at Clare before 1377, for on Sept. 12 of that year the prior of Clare and brother Robert of the same monastery come to an agreement respecting the sum of ten marks, to be paid by the said Robert in satisfaction of the expenses¹⁴ incurred for the funeral of Lionel.¹⁵ Moreover, we have the testimony of a manuscript, in English and Latin, formerly belonging to Augustine Vincent (1584?-1626), and quoted by John Weever (1576-1632) in his Ancient Funerall Monuments (folio, 1631). This manuscript, or its prototype, was written in the lifetime of Richard, Duke of York,¹⁶ father of

¹⁴ The Vict. Hist. of Suffolk says (2. 128): ‘The sum of ten marks was paid to the prior and brethren, in the chapter house, on 12 September, 1377, for their share in the funeral expenses.’

¹⁵ The instrument, from the Registrum Chartarum Monasterii Heremitarii S. Augustini de Clare, follows from Harl. MS. 4835, fol. 42ⁿ, last paragraph, with contractions expanded:

‘Hec indentura testatur judicium et finalem concordiam inter priorem conventus Clare, ordinis Sancti Augustini, ex una parte, et fratrem Robertum de Clare, ejusdem ordinis et conventus, ex alia parte, de expensis factis per predictum fratrem Robertum circa funeralia nobilis domini Domini Leonelli quondam Ducis Clarence—quod a die confectionis presentium predictus conventus assignabit fratrem vel fratres ad satisfaciendum per missas, seu alia divina obsequia, pro X marcis per predictum Robertum providendis, quas sibi removebunt pro completa solucione pro expensis omnibus omnibus [sic] circa predicta funeralia factis aprius [MS. ap’us] usque ad diem confectionis presentium; unde se prefectus predicti conventus adquietat, et se obligat omnibus et singulis personis extra conventum predictum degentibus satisfactorum ad rationem expensarum supradicti funeris vindicabantibus. Predictus vero conventus, ex altera parte, istam conditionem sibi promittit adimplere, ac eum adquietat de omnibus receptibus ratione et nomine predictorum funeralium aprius [MS. ap’us] usque ad diem confectionis presentium. Illa vero concordia judicialis fuit comprobata per fratrem Johannem Ergom, Sancti Thome doctorem permissorium ordinis et provincie, commissarium fratris Henrici, prioris provincialis ejusdem ordinis et provincie, in hanc causam specialiter deputatos [-um?], anno Domini M.CCC.LXXVII, die xii mensis Septembris, in loco capitulari conventus supradicti. In quorum omnium testimonium sigilla predicti commissarii, ac supradicti conventus, et fratris Roberti, huic indenture alternata sunt apposita.’

¹⁶ Prominent in the Shakespearian 2 and 3 Henry VI.
Edward IV and Richard III, and therefore before 1460.\(^1\) The lines in question are (Weever, p. 735):

\[
\begin{align*}
Fuit\ Elisabeth\ sibi\ nata \\
Alter\ que\ egregi\ post\ . . . \ Leonello, \\
Ed.\ ter.\ innato,\ post\ fataque\ sic\ tumulato, \\
Ut\ vides,\ exigua\ pro\ tanto\ principe\ tumba, \\
Inque\ chori\ medio.
\end{align*}
\]

And in English (p. 738):

\[
\begin{align*}
Q. \text{ Had she ony Issue?} & \quad A. \text{ Yea sir sikerly.} \\
Q. \text{ What?} & \quad A. \text{ a doughtur.} \\
Q. \text{ what name had she?} & \quad A. \text{ Liche hir modir Elisabeth sothely.} \\
Q. \text{ Who evir the husbonde of hir might be?} & \quad A. \text{ King Edwards Son the third was he,} \\
& \quad \text{Sir Lionel, which buried is hir by,} \\
& \quad \text{As for such a Prince too sympilly.}
\end{align*}
\]

This makes it clear that Lionel was buried, as his will provided, in the middle of the choir; and that he rested by his wife, Elizabeth de Burgh, in a tomb which must have formed a striking contrast to that of his brother, the Black Prince, at Canterbury, for which the latter made such lavish provision in his will. It is equally clear that Lionel’s body was not brought to England the year of his death, for we have a document,\(^2\) written in December, 1368, on the part of Edward III, in which Edward Despenser and John of Bromwych are instructed that they are on no account to transport the body of Lionel to England, because of the grief it would occasion his relatives, but to give it solemn interment in Italy:

\[
\begin{align*}
\text{Item, ils dirront as dits sire Le Despenser et monseigneur Johan} \\
\text{coment le roi voet et leur prie qu’ils ordenent en toutes manieres que} \\
\text{le corps mon dit seigneur de Clarence soit solemnement enterrés} \\
\text{par delà, sicome affiert à tieu seigneur, tant pur l’onour du roi come} \\
\text{de lui, sans faire carier par decèa le corps ou nulle partie d’ycel, pur} \\
\text{le doel et tristesse que le roi son pière, madame la roine se mière,} \\
\text{messeigneurs ses frères et mes autres seigneurs et dames de son} \\
\text{lignage ent prendroient.}
\end{align*}
\]

As the Council of Trent (1545-1563) ordered the removal from S. Pietro of all the tombs but those of saints\(^3\) (not excepting that of the Lombard king, Liutprand), Lionel’s, if any trace

\(^3\) Magenta, p. 163.
of it remained, must have disappeared with the others. As late, however, as 1590, an inscription to his memory was placed against a column near the chapel of St. Appian on the right side of the church, as being the site of his tomb. The inscription was due to Charles Parker (b. Jan. 28, 1537), who also erected in the cloister at Pavia monuments to Francis, Duke of Lorraine, and Richard de la Pole, Duke of Suffolk, who had been slain at the battle of Pavia in 1525. Having entered the Roman Catholic church, he went to Pavia in 1560, and there remained in exile for thirty years.  

The inscription reads:

D. O. M. Leonello Clarentiae Ducii Edouardi tertii Regis
Anglie Fil. ducta Violanta Joannis Galeatii primi Ducis
Mediolani sorori Albae mortuo atque anno saluti MCCCLXIX
Honorificissitissime in arca condito substata postea
Concilii Tridentini decreto Carolus Pacherus de Morley
Anglus Clarentium stirpe ortus anno suali salutis MDXC
Exili vero sui pro fide catholica XXX p.

By 1464 the place of his sepulture was in doubt in England, for Hardyng says:

Some sayen he is buried at Melayn,
And other some saye at Clare certayn.

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20 Bossi, in his unpublished Memorie Ticinenses, p. 86, quoted by Magenta, p. 135: 'In columnâ sive pila prope sacellum S. Appiani in latere dextero Templi.'
21 Dict. Nat. Biog. 43. 239.
22 How baseless was his claim to belong to the descendants of Clarence may be gathered from the following genealogical notes.
Charles' mother was, before marriage, Alice St. John, whose father was Sir John St. John, whose mother was Margaret St. John, née Beauchamp. By her second marriage, to John, first Duke of Somerset, grandson of John of Gaunt, she had a daughter, Margaret Beaufort, who, by her marriage to Edmund Tudor, Earl of Richmond, became the mother of Henry VII. Henry VII's queen, Elizabeth, was the daughter of Edward IV, who was the son of Richard, Duke of York, who was the son of Anne, Countess of Cambridge, who was the daughter of Roger, Earl of March, who was the son of Philippa, daughter of Lionel.

The inscription, as printed, gives his name as 'Pacherus,' doubtless for 'Parkerus,' since he was a younger son of Henry Parker, himself son of Henry Parker, Baron Morley.

23 Magenta, p. 135.
24 Chronicle, ed. Ellis, p. 334.
XI. LIONEL'S WILL

Lionel's will was drawn up at Alba, Oct. 3, 1368, just two weeks before he died. The bequests are:

1The will itself, from Nichols, Wills of the Kings and Queens of England, pp. 88-90, is as follows:

'In Dei nomine, Amen. Ego Leonellus, Dux Clarencie, sanus mente licet eger corpore, volensque debitum mortis prevenire, testamentum meum condon in hunc modum. In primis lego animam meam Deo et beate Marie et omnibus sanctis, et corpus meum ad sepeliend' in eccl'ia fratrums Augustinensium de Clare in choro ante magnum altere. It'tm lego eccl'ie coronem fratrums nigrum vestimentum meum cum toto apparatu. It'tm lego eid'm eccl'ie pannum meum nigrum boudatum. It'tm Violente uxori mee rubeum vestimentum meum cum coronis aureis cum toto apparatu. It'tm eidem uxori mee omnia jocalia mea exceptis subscriptis. It'tm d'no Joh'i de Bromwych militi unum dextrarium qui vocatur Gerfacon'. It'tm lego d'no Ric'o Musard militi unam zonam de auro cum uno dextrario qui vocat' Maungeneley. It'tm lego Barthe'o Pycot duas zonas de argento & deaurat'. It'tm lego D'no Joh'i de Capell capellano meo unam zonam de auro ad faciend' unum calicem in memoriam anime mee. It'tm eidem D'no Joh'i melius portiforium meum notatum. It'tm eidem Joh'i unum par vestimentorum pauleatum cum albo & rubro. It'tm lego mag'ro Nich'o de Haddeleye unum parvum portiforium non notatum. It'tm lego D'no Joh'i Wayte capellano unum portiforium notatum. It'tm lego Thomae Waleyis unum circulum aureum, quo circulo frater meus et dominus creabatur in principem. It'tm Edmundo Mone lego illum circulum quo in ducem fui creatus. It'tm lego mag'ro Nich'o de Haddeley supradicto duo monilia de auro, blodio & viridi colore anamalat'. It'tm lego Nich'o Bekknesfeld unum monile de auro cum duabus manibus inclusis. Item lego eidem Nich'o decem marcas annui redditus in manerio de Bremesfeld ad totam vitam suam percipiend'. Et lego Rob'to Bardulf unum monile de auro ad modum cordis factum. It'tm volo quod omnes annuli distribuantur inter valetos camere mee secundum dispositionem executor' meor'. It'tm volo et executoribus meis injungo q'd nulla fiat bonorum meorum seu terrarum mearum saltim quas vendere seu donare possum aliquibus deliberatio seu dissipacio exceptis legatis supradictis, quousque debita mea secundum quod facultates mee ad hoc suppetunt plene persolvantur, et si quod residuum fuerit, volo quod sit in dispositione executorum meorum. Hos vero constituo & facio hujus testamenti mei secundum ultimae voluntatis mee executorum, videlicet Violentam uxorem meam, Barth'm Pycot et D'nim Joh'm de Capell' capellanum, quibus adjungo D'nim Joh'em de Bromwyche militem coadjutorem, non tanquam executorum.
To the church at Clare, a black suit with all the appurtenances, and a piece of embroidered black cloth.

To his wife, Violante, his scarlet robe embroidered with golden coronets, with all the appurtenances, and all his jewels except as otherwise devised.

To Sir John of Bromwych, knight, a war-horse, named Ger-falcon.  

Acta sunt hie anno ab incarnacione D'ni millesimo tricentesimo sexagesimo octavo, indictione septima, mentis Octobr' die tercia, pont' sanctissimi in Xp'o patris ac d'ni n'ri d'ni Urbani divina providencia pape quinti anno sexto, in camera ip'ius d'ni ducis, infra muros civitatis Albanen' situat'; presentibus Nich'o de Bekennesfeld, Rob' to Bradwaye, Joh'e Bray, et alis.

Et ego Nich'us de Haddeleye, clericus Miden' dioc' publicus auctoritate apostolica notarius, premissis omnibus et singulis supradictis dum sic ut premittit' agerent' et fierent una cum prenominat' testibus presens interfui, eaq' omnia et singula sic fieri vidi et audivi, scripsi, publicavi, et in hanc publicam formam redegii, signoq' meo consueto signavi rogat' in fide et testimonium premisser'.

Probatio dicti Testamenti coram Will'mo Cant' Archiep' 6to Idus Junii 1369, apud Lambeth.

Regist' Witlesey, fol. 100.a.b. in the Archiepiscopal Registry at Lambeth.'

2 In his earlier manhood, John of Bromwych must have been of a wild and heady disposition, for on March 8, 1353, the constable of the Tower of London was ordered to release him without delay, on the understanding that he was in due time to make answer to 'the things which the king wishes to say against him' (Cal. Close Rolls); while on Feb. 7, 1357, he was pardoned 'with respect to the death of Walter of Bromyard, late burgess of Hereford' (Cal. Pat. Rolls). Feb. 16, 1361, he had a wife, Elizabeth (Cal. Close Rolls), probably the same as the Elizabeth, widow of Richard Talbot the elder, whom he is described as having taken to wife by Oct. 20, 1370 (Cal. Pat. Rolls), and who on Feb. 10, 1357 (cf. Jan. 26 and Feb. 8, 1358) was already the widow of Talbot (Cal. Close Rolls). By April 1, 1373, she was already dead (Cal. Pat. Rolls). Mar. 15, 1361 (so also Feb. 10, 1362), he was important enough to be summoned, with Edward Despenser and others, to a council to consider the state of Ireland, and to prepare for supporting Lionel, whom the king then designated (Rymer), and by May 10 (so Dec. 20, 1363) he was on a commission (ib.). By Mar. 8, 1364 (so May 26, 1367), he was already associated with Edward Despenser in the commission of the peace (ib.), and on Feb. 10, 1367, was with him in a commission of array (ib.). On July 8, 1368, he was summoned, with others, to return to his estates in Ireland (Rymer). On Sept. 22, 1374, he obtained protection to go abroad.
To Sir Richard Musard,4 knight, a golden girdle, and a war-
horse, named Maungeneleyn.5

with Edmund, Earl of March (Rymer). On Aug. 26, 1379, he went to
Ireland, accompanied by 60 men-at-arms, 120 archers, and several knights
(Cal. Pat. Rolls), and on Sept. 22 received his appointment as justiciary
for Ireland, an office which he still held on Feb. 14, 1380 (ib.). On July
2, 1383, he was still justice of the peace, as he had been much earlier (ib.).
He is mentioned on Nov. 14, 1385, but had apparently died before Sept.
25, 1388 (cf. May 29 and June 26, 1389; all Cal. Pat. Rolls). His execu-
tors are named on Aug. 17, 1389, first in order being his (second) wife,
Katharine (ib.).

Concerning his relations with Lionel, three things stand out. First,
before and after Lionel assumed the viceroyalty of Ireland, Bromwych was
appealed to concerning the affairs of that island. Secondly, he had been
associated, before the journey to Italy, with Despenser, Lionel’s cousin
and close friend (both being of Gloucestershire), in the commission of
the peace. Thirdly, the king treated him with especial kindness because
of his devotion to Lionel. Thus, in the document quoted above (p. 94)
we read:

‘Item, ils remerciertont à monseigneur Johan de Bromwyche du bon
service qu’il fist à monseigneur le duc en sa vie, et de la diligence
quele il mist pur la salvation del honour du roi et du duc es parties
de Lumbarde, à ce que le roi est bien vraiment enformés, dont le
roi lui sciet très-bons grées.’

And as late as May 13, 1371, the king showed his favor on this account,
as will appear from the following document of that date (Cal. Pat. Rolls):

‘Whereas, because John de Bromwiche, ‘chivaler,’ who held and
holds for life the town of Banowe and other lordships and lands in
Jeripont and Ederdrym, co. Wexford, held in chief, with reversion to
Elizabeth, his wife, and her heirs, did not come to Ireland or send
men in accordance with the late ordinance for the safety of that land,
nor did the said Elizabeth do so, the said lands were taken into the
king’s hand as forfeit and are still in his hand; the king, in considera-
tion of the fact that John has made continual stay from the time
of the said ordinance until now, first with Lionel, duke of Clarence.
in the parts of Lombardy during the duke’s life, and afterwards with
Edmund, earl of March, the king’s son, on the king’s service in France
and England, has pardoned the said forfeiture and has restored the
premises to him for life with reversion as above.’

To be, or to have been, a loyal servant of Lionel’s seems always to have
been a passport to Edward III’s grace. A few instances follow (all
Cal. Pat. Rolls except the first):

1363, March 1. Grant of £200 annually to the Countess of Ormond for
her husband’s labors and expenses in the Irish wars, especially from the
coming to Ireland of the king’s dear (carissimi) son Lionel (Rymer).
To Bartholomew Pycot, two girdles of silver gilt.
To his chaplain, Sir John of Capella, a golden girdle, to make a chalice in memory of his soul; his better portas [portable

1368, Aug. 1. William de Mundene is pardoned for the death of Geoffrey Elesbourne, 'the king being informed that he is staying in the parts of Ireland in the service of himself and his son Lionel.'

1369, Nov. 19. Hauulus de Bohen, a minstrel, is granted sixpence (say $2.00) a day for life, 'for good service to the king and to his son.'

1370, Nov. 7. John Pitteman is granted £5 yearly, 'for long service to Lionel, late duke of Clarence.'

1371, May 10. John Comyn, who, on June 4, 1363, had attended the Duchess of Clarence to Ireland, and then remained there with Lionel (Rymer), having forfeited his manor of Kynsall for failure to repair to Ireland, or send men for the defense of that land, when so commanded, this manor was restored to his heirs, (1) because of good service in the king's wars in Ireland and elsewhere, (2) because he had leave to be absent from April 9 to Nov. 11, to attend Lionel abroad, (3) because he kept the manor in order to reimburse himself for his expenses in Lombardy, (4) because he died before he could return at Martinmas.

1372, May 4. The office of chief sergeant of the county of Kildare is conferred upon John atte Vise, 'for good service to the king and Lionel.'

1372, Oct. 16. Robert Bron is granted the chief sergeanties of the counties of Louth and Carlow, 'for good service done in the company of the king's late son Lionel' (ratified Oct. 8, 1373).

1374, Nov. 14. Nicholas Curteys has allowances from Aug. 26, in consideration of his good service to the king's son, Lionel.

The bearing of all this upon Lionel's character, the attachment he inspired, the king's affection for him, and Edward's corresponding willingness to reward Lionel's faithful followers, is not without interest in relation to Chaucer's conjectural sojourn with the duke in Ireland and Italy, and the grant to Chaucer of June 20, 1367 (cf. Hist. Background, pp. 179, 182).

3 See Hist. Background, p. 72.

4 Sir Richard Musard was, it appears, for twenty-two years (1361-1383) a retainer of Amedeo VI of Savoy, the Green Count, a period ending with the count's death. He was probably attached to the person of Lionel only during the time of the latter's journey from Savoy to Milan, and the interval between then and his death. In becoming the liegeman of Amedeo in 1361, he had reserved his duty to the King of England; and Amedeo showed his attachment to Lionel, whose marriage he had doubtless negotiated (see pp. 23 ff.), by transferring to him the services of so devoted an homager and friend.

The known facts concerning Musard are as follows:

1361, between June 6 and Sept. 17, he was for 17 days at Susa, and afterwards on a trip to Germany, in the interest of Amedeo (Gabotto,
breviary], with musical notes; and a pair of vestments [trousers?], striped white and red.\(^6\)

in *Atti della R. Accademia delle Scienze di Torino* 34. 226, note 1). At this time he was called the Black Squire (there is a *Green* Squire mentioned under the year 1369 in *M. H. P.*, p. 1018). On Sept. 17, at the Green Count’s camp near Carignano, he became the vassal of Amedeo (Claretta, in *Atti*, as above, 19. 958).

1362, Feb. 10, the acknowledgement of a debt of 100 florins is made to him at Chambéry. His wife is called Johanna, and he still the Black Squire (Claretta, p. 950). Later in the same year he becomes the fifteenth charter-member of the Order of the Collar, afterwards called of the Annunciata, at its founding by the Green Count (Claretta, p. 953). In the original documents he is called ‘ung vaillant chivalier d’Engleterre, bon et hardy’ (*M. H. P.*, 3 (Script. 1). 295), and ‘bonus, valens, et audax’ (*ib.* 1. 612). The order was instituted in honor of the Fifteen Joys of the Virgin. The collar was made of linked laurel-leaves, enameled in green, with a pendant of three love-knots, having in the middle the Count’s motto *fort* (cf. *Encyc. Brit.*, 11th ed., 15. 865). The knights were to be without reproach, were not to forsake another in life or death; and if any occasion of dispute arose between them, the disputants were to submit themselves to the judgment of the other members. Each knight was to recite every day fifteen *Aves*, and a monastery was founded for the salvation of the knights’ souls, present and to come. On the occasion of the founding, a mass was first sung, and then a banquet set forth. The ordinances, which were proclaimed to the sound of trumpets and clarions, provided that an unworthy member should be expelled, that they should support widows and orphans, oppose false quarrels, and maintain loyalty. Then Savoy Herald proclaimed silence, and the Green Count said: ‘My lords, know ye that I swear and promise to keep these laws, and I am the first to take this collar, not as lord, but as brother and companion, for it is an order of brethren.’ After each had sworn his oath, and received his collar, John of Vienne, Admiral of France, being one, they all partook of the sacrament, kissed one another on the mouth, and sat down to the feast, the Green Count last of all (*M. H. P.*, as above, pp. 294-5). The rest shall be told in the words of the chronicler (pp. 295-6): ‘Le service fist fait; la eust joye planyere; la furent dames et damoy-selles; la fist creyee largesse; la eust accomplissement donneur, de joye et de liesse a comble mesure de tous instrument, et ainsy dura celle feste trois jours, a joustes, a tournoys, a beours, a momeries a la nuyt jusques au jour. Lon ne soroit raconter les desduys et plaisances qui la furent faittes, et se il faison beau veoir les quinze chivalliers a tous leurz quinze colliers, tous vestus de mesmez, il ne le faut desmaner, et ainsy fist encomensce lordre du noble collier de Savoye.’

1366, May 27, he was with the Green Count at Pavia, where Amedeo was one of the sponsors at the baptism of Valentina, daughter of Gian Galeazzo. At this time the Count was on his way to the East for the
To Master Nicholas of Hadley, a small portas, without notes, and two gold necklaces, enameled in red and green.

To his chaplain, Sir John Wayte, a portas, noted.

deliverance of John Paleologus, Emperor of Constantinople (Claretta, p. 663; Le Roulx, p. 148). For the festivities on this occasion, when Amedeo gave Gian Galeazzo a charger worth 1000 florins, see Magenta 1. 129-130. Between Aug. 17 and 23, Musard was present with his master at the successful siege of Gallipoli. The walls were undermined, and the assailants entered at the breach (Le Roulx, p. 151; Claretta, p. 963). The Turkish bowmen pierced the feet of the Christians, which placed them hors de combat. Huguin de Virier, being otherwise engaged, did not see an advancing Turk, who succeeded in stabbing him, but at this his squire transfixed the Turk with his spear. Nothing daunted, the Turk advanced along the spear, in order to come to close quarters with the squire, but died before he reached the middle. The Christians advanced in the face of Greek fire, and of stones dropped from the walls. The rear-guard being in danger, the count flew to the rescue, and with him his standard-bearer, Musard, of whom the chronicler relates (M. H. P., pp. 307-8): 'La fust messire Richart Musar qui la bannyere portoit du conte, le quel se mist sy avant et entra sy parfont en lestour qu'il rompist la presse des Turcs; et tellement le suyvist lavant garde, que les Turcs furent bien esbays, et la furent faites maintes belles apprentizes darmes entre Cristiens et Turc.' The Turks outside were put to flight, and the next morning it was found that the defenders had abandoned the city, leaving behind only some Greek prisoners, who cried out to the Christians that they might now enter without fear.

1367, Sept. 12, Musard receives 6 florins at Ferrara for expenses, the Green Count having now returned from his expedition (Claretta, p. 964).

1368, Oct. 3, he is mentioned in Lionel's will.

1372, July, in arraying his army for battle at Asti, Amedeo entrusts the guard of his person to Musard and another knight (M. H. P. 3. 327).

1373, Oct. 22, Musard is in attendance upon the Green Count in the castle of Rivoli, where Amedeo is settling a dispute between two noble families of Susa (Claretta, p. 965).

1377, Musard is dispatched by Amedeo on an important mission to Biella (Claretta, p. 965).

1380, he and another member of the Order of the Collar are sent on an embassy to Bernabò Visconti (Claretta, pp. 965-6).

1381, Aug. 8, he is present on one of the most glorious occasions of the Green Count's life, when the latter pronounces his decree as arbiter between the contending cities of Genoa and Venice (Claretta, p. 966; Muratori, Annali d'Italia 8. 397; M. H. P. 4 (Jur. 2). 858 ff.; R. I. S. 15. 797).

1382, July, Musard is with Amedeo when he joins the forces of Louis of Anjou for the invasion of Neapolitan territory (Claretta, p. 966; Amedeo left Chambéry toward the end of May, Cordey, p. 240).
To Thomas Waleys, the golden circlet with which his brother\textsuperscript{7} was created prince.

To Edmund Mone, the circlet with which he himself was made duke.\textsuperscript{8}

To Nicholas Beaconsfield,\textsuperscript{9} a gold necklace, enclosing two hands, and ten marks annual pension for life on the manor of Brimpsfield [Gloucester].\textsuperscript{10}

To Robert Bardulf, a gold necklace in the shape of a heart.

To the valets of his chamber, all his rings, distributed as to his executors shall seem good.

All other property, real or personal, to be kept for the payment of his debts.\textsuperscript{11} Whatever then remains to be apportioned

\textsuperscript{7}The Black Prince (1330-1376). This was on May 12, 1343 (\textit{Dict. Nat. Biog.} 17, 91).

\textsuperscript{8}On Nov. 13, 1362.

\textsuperscript{9}Beaconsfield was summoned to proceed to his estates in Ireland on July 28, 1368 (Rymer), along with Bromwynch and John Comyn (see p. 99).


\textsuperscript{11}Lionel must have been deeply in debt, perhaps because of the expenses incurred in Ireland. Already on Feb. 10, 1362 (Rymer), Edward III speaks of Lionel's remaining in Ireland at great charges \textit{(ad sumptus excessivos)}, when he had been there less than five months. On April 24, 1364, Lionel, who had had his salary advanced to 13s. 4d. ($50) a day on Nov. 12, 1362, when he was made duke, accepted a bond (but perhaps this is to be understood rather as an order on the treasurer) from Edward III for the whole of his stay in Ireland from the date 1383, March 1, Amedeo VI dies, and his body is transported to the seashore near Naples by Musard and others, who embark with it for the Ligurian coast. On April 23, Musard dies at Savona (Claretta, p. 667; cf. Cordey, p. 242, note 6; M. H. P., p. 1026), and is buried in the church of St. John of Jerusalem (Claretta, \textit{ib.}). In general, cf. Mugnier, \textit{Lettres des Visconti}, pp. 20-23.

Gabotto (pp. 226-7) is tempted to identify him with Richard de la Vache, knight and chamberlain of Edward III, but this seems impossible (cf. Edith Rickert, in \textit{Modern Philology} 11, 210 ff.).
by the executors—Violante his wife, Bartholomew Pycot, and John of Capella,\textsuperscript{12} to whom is added John of Bromwych, not as executor, but as coadjutor.

The witnesses were Nicholas Beaconsfield, Robert Bradway, John Bray, and others.

Nicholas of Hadley, clerk of the diocese of Meath, was the notary who drew the will, and affixed his seal.

The will was admitted to probate at Lambeth Palace, June 8, 1369, William Whittlesea being Archbishop of Canterbury.

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last mentioned (Rymer). In December, 1368, the king sends word to Edward Despenser and John of Bromwych (see p. 97) to save everything possible for the discharge of Lionel’s debts (Kervyn 18. 490):

‘Item ils dirront as dits sire Le Despenser et monseigneur Johan et leur chargeront depar le roi qu’ils mettent leur peine et diligence que si bien les joialx come monnoie, et tous autres biens et chateux qui feurent à monseigneur le duc par delà, soient sauvement gardés et si entièrement come l’en purra par aucune voie, pur acquiter ses dettes en descharge de sa alme.’

On Feb. 17, 1370, the king speaks of the large sums Lionel owed to various creditors, during his lifetime and at his death (‘in non modicis pecunie summis diversis creditoribus, dum vixit et tempore mortis sue, tenebatur’). Cf. Hist. Background, p. 188, note 1. It cost $13,400 merely to transport his retinue, on his journey to Italy, from Dover to Calais, 39 ships and 13 boats being required for 457 men and 1280 horses (Rymer, account of May 10, 1368). His total expenses for the journey to Milan were computed as $475,000 (Devon, Issues of the Exchequer, p. 192); but it is true that Violante’s dowry was, in money, 100,000 florins = £15,000 = $1,125,000. The contrast between Lionel’s poverty at his death and the property of the Black Prince will be apparent on consulting the latter’s will (Nichols, pp. 66 ff.).

\textsuperscript{12}Pycot (known also as Pygot) and Capella (also called Capell) are mentioned together as executors on Feb. 17 (Rymer) and Feb. 20, 1370, and on April 22, 1371 (Cal. Pat. Rolls). On Jan. 19, 1367, Capella is mentioned as being near Paris (Rymer), and on Sept. 4, 1367, Pycot receives protection till Feb. 2 to go abroad on the king’s service (Cal. Pat. Rolls).
XII. DESPENSER AND THE VISCONTI

After Lionel’s death, Edward Despenser, who was next in command, established his headquarters at Alba, and declined to restore to Galeazzo the Piedmontese places which formed part of Violante’s dowry. Thereupon Galeazzo declared war upon

1 Despenser (b. 1336?) was the second cousin of Lionel’s first wife. He fought at Poitiers, and was a Knight of the Garter. Edward III calls him ‘our dear cousin’ on Nov. 21, 1374 (Rymer). He distinguished himself in the service of Urban V (d. Dec. 19, 1370), if we may trust the testimony of Walsingham (i. 309; cf. Cont. Murimuth, pp. 206-7): ‘Pro Papa vero militavit Dominus de Spenser, qui laudabitur se gessit ibidem post mortem Ducis Clarentiae.’ He died in 1375, leaving a son, Thomas, who became Earl of Gloucester. Froissart spent three days with him at Berkeley Castle in September, 1366 (Kervyn 2. 86), and celebrates him in the following lines (Buisson de Joncée 260-277):

—‘Et le grant seigneur Espensier,
Qui de larghece est despenser,
Que t’a il fait?—Quoi? di je, ‘assés;
Car il ne fu onques lassés
De mo donner, quel part qu’il fust:
Ce n’estoient cailliel ne fust,
Mès chevaus et florins sans compte;
Entre mes mestres je le compte
Pour seignour, et c’en est li uns.’

Elsewhere he calls him ‘li plus jolis chevaliers, li plus courtois, li plus honnourables et amoursus qui fust en tout Engleterre’ (Kervyn 2. 106); ‘friche, gentil, et vaillant chevalier, et grant chapitaine de gens d’armes’ (ib. 8. 280); ‘gentil coers et vaillans chevaliers, larges et courtois’ (ib. 8. 312). See also p. 73.

2 ‘Ipsius Leonoti gentium ductor’ (Benvenuto).

3 This would seem quite unjustifiable, in the light of the marriage-contract (see p. 29), which explicitly provides that ‘defuncto dicto dominio Leonel-lo sine herede de dicta domina Violante procreando, dominium dictarum terrarum ad praefatum dominum Mediolanensem, et ejus heredes, integre devolvatur’ (Rymer). Despenser’s action is attributed by Froissart to the suspicion (see p. 88) that Lionel had been poisoned (Kervyn 7. 251; cf. 8. 112-3, 208):

‘Vous avés bien chy-dessus oy comment li dus de Clarensé fu mariés en Lombarde à le fille monseigneur Gálás, liquels dus, assés tost aprîs son mariage, trespassa de ce siècle [en Ast en Piémont], dont ses gens furent moult esmervilliet; car il estoit jones chevaliers, fors et appers durement. Si soupeçonnèrent que on ne l’eust empoisonnent, et en fist guerre moult grande et moult forte li sires Despens-
him, and dispatched a body of troops to Piedmont, under the command of Azino Caymo and Giacomo del Verme. The latter were taken prisoners in an engagement, carried captive to Alba, and only released on the payment of a heavy ransom. Plucking up heart, and obtaining some men-at-arms from Bernabò, Galeazzo again endeavored to wrest the territories from the English. However, after his capture of Cherasco and some other places,

siers as seigneurs de Melans et à leurs gens, par le comfort d'aucuns chevaliers et escuiers et archiers d'Engleterre, qu'il avoit avoecq lui, et tint par le guerre les seigneurs de Melans mout court, et rau par pluisseurs fois ses gens jus, et y fu pris, dou costé des seigneurs de Melans, li sires de Montegny-Saint-Christoffle en Haymnuau, et ossi messires Aimeris de Namur, fils bastars au conte Guillaume de Namur, et fissent là li Engliès une guerre mout honnerable pour yaux, et reboutèrent pluisseurs fois les Lombars et lors aidans.'

With reference to the suspicions of poison, Gian Galeazzo is reported never to have sat down with the nobles whom he feasted. He took his meals apart, and, 'ne more patrie infìceretur veneno,' first had every dish tasted by twenty of his officers (Religieux de Saint-Denys, ed. Bellaguet, 3. 134). On the effects of excess, particularly in relation to Lionel, see Michelet 5. 27; cf. 4. 160; 5. 118-120; Lavisse 4. 1 303-5. Chron. Plac. (R. I. S. 16. 546) calls him 'non bene ordinatum,' which probably signifies a certain lack of self-control.

But a no less valid reason is to be found in the desire of the English to anticipate the birth of a posthumous heir to Lionel, in which event Galeazzo would forfeit his claim upon the towns. This is made clear by a communication addressed to Despenser by Edward III in December, 1368, and dispatched by William de Aldeburgh and Robert de Wykford, Archdeacon of Winchester, on the occasion of their going abroad to treat with Pope Urban V, their commission dating Nov. 29, 1368 (Rymer). The earlier part of this letter runs (Kervyn 18. 489-490; see also pp. 94, 98, 103):

'Premièremenct ils dirront au sire Le Despenser coment le roi ad bien entendu ses lettres et la crédence exposée de sa part à lui et à son conseil par Sifred son esquier, et coment le roi lui remercie du bon service qu'il fist à monseigneur de Clarence en sa vie et de les graunts diligence, peine et travaux, queil mist pur la salvation del honour du roi et du sien és parties de Lumbardie, et lui ent sciet molt especiallyon bon grée, et pense par celle cause de lui faire et montrer si bone seignourie en tems, avenir, és choses qu'il avera affaire devers lui, qu'il soi ent tendra pur content, si Dieu plest.

Item, ils remerciert par especial à meisme le sire Le Despenser de ce que puis la mort mon dit seigneur de Clarence, il soi ad tenus en pais de Pymond sur le gouvernement des terres qui feurent à mon-
a truce was arranged; the Marquis of Montferrat, Giovanni II (1338-1372), was invited to act as arbiter; and Despenser repaired to Pavia, where a treaty was to be negotiated. Just at this moment, the Marquis of Montferrat left for Pisa, to obtain certain privileges from Charles IV, and nothing further was done for the time being. Upon the Emperor's return to Bohemia in 1369, war again broke out between the Marquis and Galeazzo. With the assistance of Bernabò and Can Signoria della Scala of Verona, Galeazzo sent troops in July and August to the vicinity of Alessandria, and laid waste grain-fields and vineyards. By way of retaliation, the Marquis, assisted by the English, whom he had taken into his pay and persuaded still longer to retain the towns of Violante's dowry, burnt Blan-drate and Garlascho, and carried off abundance of cattle. Luchino del Verme, in command of Galeazzo's army, took fright and ran away. While these things were in progress, Despenser found himself in need of money to defray the cost of the occupation, and, on Oct. 27, 1369, borrowed 26,000 golden florins from the Marquis of Montferrat, with the condition that he was to repay the sum in eight months. All the Piedmontese places were pledged as security, with the stipulation that the revenues derived from them in the meantime should be used to defray

seigneur le duc illoèques, et lui prie aussi de remercier depar le roi les gens demorants sur meismes les terres de la bone affection qu'ils ont au roi et de ce qu'ils désirent d'estre desous la seignorie et gouvernement de lui, sicome lui estoit monstres parmy la dite crédenz, et dirront au dit sire Le Despenser coment le roi lui sciet graunts grées et se tient bien pur content de ce qu'il y ad ensi demorés, et voet et lui prie qu'il demoere sur le gouvernement de meismes les terres sicome il ad fait, tanque l'en puisse savoir si madame la duchesse soit enceynte ou nom et tanque le dit sire Le Despenser en eit autre manedement du roi.'

From this letter it is plain (1) that Despenser had done Lionel good service in the duke's lifetime; (2) that Edward III approved of his having held the Piedmontese lordships; (3) and that the king was prepared to yield the properties as soon as it was established beyond doubt that Lionel was to have no posthumous heir by Violante.

The basic account is that by Petrus Azarius, quoted by Benvenuto Sangiorgio (M. H. P., pp. 1337-9=R. I. S. 23. 559-560, cf. 554); cf. Galeotto del Carretto (M. H. P., pp. 1212-4); Gioffredo della Chiesa (M. H. P., p. 1013).

Benvenuto (M. H. P., p. 1337) says 'Secundoto,' but wrongly.
their running expenses, including the cost of the necessary measures of defense.⁶

The upshot of the whole matter is to be gathered from Froissart, who declares that Galeazzo cleared himself by oath of the imputation that he was in any way responsible for Lionel’s death, and that Amedeo of Savoy, the astute diplomat and indefatigable negotiator, at length reconciled the contending parties (Kervyn 7. 252):

Li sires Despensiers s’apaisa à yaux, parmy tant qu’il s’escusèrent de le mort le duc de Clarense, et jurèrent que par yaux, ne par leur couppe, il n’estoit mies mors [en le fin, messires li contes de Savoie s’en ensonnia et les mist à acord].

From an independent source (M. H. P., p. 1018) we learn that Galeazzo was in possession of several of the contested towns at the end of 1369 and beginning of 1370.

Barnes’ account is characteristic (cf. Higden, Polychr. 8. 371):

But the Lord Edward Spencer, who doubted some foul play had been used towards him, tarried still in Italy, and together with Sr. John Hawkwood, and his Englishmen, called the White-Company, made fierce War upon the Dukes of Milain, in Revenge of his Masters Death; till at last he was fully satisfied of their Innocence as to that point, and their great and unfeigned sorrow for the untimely loss of so Noble a Kinsman.

XIII. VIOLANTE’S LATER LIFE

As we have seen, Violante was a widow before she was 14, after four months of marriage.¹ We hear nothing of marriage again until 1374, when she was sought by the widowed Albert, Duke of Austria, but without result, as the Pope had forbidden that any princely house should intermarry with the Visconti.² On Aug. 2, 1377,³ at the age of 22, she was wedded to a youthful

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⁶See the original mortgage, R. I. S. 23. 554-9.
¹See p. 86. Cron. Monf. (M. H. P., p. 1228) conceives of her as living for a time with Lionel in England, and then returning to her father’s house.
²See Giulini 5. 567-8; 7. 243-4; Magenta 2. 38.
³So R. I. S. 23. 594 (Azarius says May, R. I. S. 23. 597, and so M. H. P. 3. 1340). Negotiations to that end had been begun by Sept. 14, 1376, an agreement had been reached by March or April, 1377 (R. I. S. 23. 594;
monster, Otto, Marquis of Montferrat, commonly called Secondotto, then a lad of 15 to 18 years old. He lived a year and four months—at least once in that period inflicting a wound on Violante—and died as a result of his own cruelty on Dec. 16, 1378.

Corio, p. 491), and an instrument confirming it drawn up on June 15 (R. I. S. 23. 594; cf. Muratori 8. 377), the object of the whole being to put an end to hostilities between Galeazzo and Montferrat (cf. M. H. P., p. 1025). The wedding took place in Pavia, 500 gentlemen being present. The marriage was not consummated till November, 1377 (R. I. S. 23. 596; cf. Corio, p. 492). After remaining for a few days with Violante at Pavia, after the manner of bridegrooms ('secondo il solito de i maritati'), he rode away to Asti, in charge of which he had left a brother of his guardian (R. I. S. 23. 596; Corio, pp. 492-3). Being instigated thereto by Galeazzo (R. I. S. 23. 596), the latter refused Secondotto admission. In hot haste the Marquis returned to Pavia, and requested help from Galeazzo, who sent 300 gentlemen (900 men), under the command of Gian Galeazzo, to his assistance. The joint army advanced to Asti, which they entered on Feb. 6, 1378. In the end, as Gian Galeazzo remained in possession of the city, and would not yield it up to the Marquis, the latter betook himself to Pavia, and made complaint to Galeazzo. This application resulting in nothing, he left Pavia in high dudgeon (R. I. S. 23. 596-7; Corio, p. 493).

4 The evidence is somewhat contradictory: R. I. S. 16. 511, 541 (and so Giuliani 5. 595), 762-3; M. H. P., p. 1339 (and so Magenta i. 136).

5 'Etiam vulneravit dictam Dominam Violantem uxorem suam' (R. I. S. 16. 541).

6 Riding away from Pavia, as we have seen above, Secondotto directed his course toward Cremona, and thence into the diocese of Parma (R. I. S. 23. 597; Corio, p. 493), intending by that route to enter Montferrat (Corio; but Piedmont, R. I. S., p. 770), in order to avoid passing through the territories of Galeazzo (Corio). Arrived at Langhizarano (R. I. S. 16. 770; 23. 597; but Mataleto, Corio), 15 miles south of Parma, he was about to hang, or strangle ('laqueo suspendere') a little lad of his suite ('infantem ejus ragazium,' R. I. S. 16. 770; Muratori 8. 383, 'un ragazzo di suo seguito'; Giuliani 5. 596, perhaps without sufficient warrant, 'un ragazzo di un certo soldato Tedesco', and so Leo 3. 323), when a (lit. another, 'unus alter') German servant of his, roused to desperation, drew his sword, and struck Otto such a blow on the head that he died four days afterward. This is the account of the Milanese annalist (R. I. S. 16. 770), who explains that, carried away by an access of rage, the Marquis, as he passed along, was wont to slay with his own hands men, boys, and infants, and in this manner did actually kill considerable numbers. The Chronicle of Piacenza (R. I. S. 16. 541) says that as he was seeking to kill some of his servants, they, in defending themselves, gave him wounds of which
Thus a second time widowed, Violante returned to Pavia, this time to the care of her brother, Gian Galeazzo. He, terrified by the threats of his uncle Bernabò,\(^7\) wedded Violante, not more than 26 years old, to the latter's son, Lodovico, then 22,\(^8\) probably in April or May, 1381.\(^9\) On May 6, 1385, as has been stated above,\(^10\) her husband, with his father, Bernabò, and his brother, Rodolfo, was arrested and lodged in prison. In December of that year Bernabò died in confinement, having eaten, as was

he died in 15 (sic) days. Benvenuto (R. I. S. 23. 597) affirms that on the 11th of December he was struck on the head by one of his servants, and died on the 16th; Corio (p. 493) adds, 'in a stable.' Jovius' words are: 'quum Otho in montibus Parmensium ab agresti agasone confossus, ignobili fato perierit,' which Stow (see p. 62) renders: 'being in the hills of Pavia [sic], stabbed through of a base horse-keeper, where he likewise died obscurely.' His body was carried into Parma, and buried before the high altar of the Cathedral (Benvenuto; Corio; Annal. Med.), being strewn with spices, and lapped in lead (R. I. S. 16. 770: 'in quadam cassetta plumbea cum aromatibus').

\(^7\) Bernabò had prohibited Gian Galeazzo, his sons, and Violante, from contracting matrimony except with Bernabò's sons or daughters, and commanded his own sons to treat Gian Galeazzo as a deadly enemy if he disobeyed (R. I. S. 16. 797-8). The desire to placate Bernabò was at least partly responsible for the union of Lodovico and Violante (R. I. S. 16. 543), as well as for Gian Galeazzo's own marriage to Caterina, the daughter of Bernabò, on Nov. 15, 1380 (Rosmini 2. 149-150; Leo 3. 325-6).

\(^8\) He was born in September, 1358 (R. I. S. 17. 499 says he was 28 years old in 1385), and probably baptized Sept. 30 (Sunday, Oct. 1, according to R. I. S. 15. 484, but that was Monday); cf. Magenta 1. 170-171; Rosmini 2. 89-91; Giuliani 5. 433-4. His sponsors, the lords of Ferrara, Mantua, and Bologna, purchased their peace with Bernabò with costly christening-gifts (Muratori 8. 300); thus Aldovrandino III, Marquis of Ferrara, presented the infant with a silver vase, containing a golden cup full of pearls, rings, and precious stones (R. I. S. 16. 729; Corio, p. 457), the whole being valued at 10,000 florins (R. I. S. 15. 484). The occasion was celebrated with jousts and tournaments (R. I. S. 15. 629; 16. 729; Corio, p. 457). Lodovico was the second son, Marco being the first (Corio, p. 509). In 1378 he had accompanied his sister Valentina to Cyprus (R. I. S. 16. 771; cf. Giuliani 5. 605), to be married to Pierre II (cf. p. 118).

\(^9\) Corio, p. 500; R. I. S. 16. 543, 773-4; cf. Muratori 8. 395; Giuliani 5. 623; Rosmini 2. 149; Magenta 1. 171. The wedding was at Pavia (R. I. S. 16. 774), and Gian Galeazzo gave her a dowry of 100,000 florins (Corio).

\(^{10}\) See p. 19.
believed, of a poisoned dish. Lodovico and his brother were removed to another prison, and she never saw him again,\textsuperscript{11} since she died, as we have seen, in November, 1386.

Twice a papal dispensation had to be obtained to enable her to marry, the suitors being within the prohibited degrees of affinity.\textsuperscript{12} The first of these was a violent madman.\textsuperscript{13} The second, Lodovico, so it is expressly said, she married against her will.\textsuperscript{14} In less than 19 years she was wedded and widowed three times, her marriage each time being from considerations of policy. She had no child by any of her husbands. Her father was scheming and ferocious; her uncle (also her father-in-law) was scheming and ferocious; her third husband was scheming and ferocious; \textsuperscript{15} her second husband was ferocious, but unequal to successful scheming. The groans of the oppressed were to be heard on every side; battle, murder, and sudden death, were the incidents of daily life; all the cold and glittering splendor which marked the high days of her life was paid for with intolerable exactions, with coins wrung from the poor, with the tears and sighs of the overburdened. She herself was the plaything of politics, the tool of magnificent and unscrupulous tyrants, the most unfortunate of wives and widows; yet a modern historian can say\textsuperscript{16}: ‘She was a lady of sweet and honorable soul. It rarely happens that in one house are found three spirits so exquisite, so compassionate, and so swift to all goodness, as were Bianca of Savoy,\textsuperscript{17} Isabella of France,\textsuperscript{18} and Violante, between whom the slightest dissension never arose. They were noble souls in lovely bodies, and Heaven only knows what good they wrought in natures like those of Galeazzo and his son.’

\textsuperscript{11} So \textit{R. I. S.} 16. 546. She died in Pavia, and was buried in S. Pietro Ciel d’Oro (\textit{R. I. S.} 16. 546, 778).
\textsuperscript{12} \textit{R. I. S.} 23. 594; \textit{M. H. P.} 3. 1340.
\textsuperscript{13} ‘Non bene sensatus’ (\textit{R. I. S.} 16. 541, cf. 546); ‘qui sævis et difficilimis moribus erat’ (\textit{R. I. S.} 23. 597); ‘un umor bestiale e quasi furioso’ (Muratori 8. 383).
\textsuperscript{14} \textit{R. I. S.} 16. 546, 778.
\textsuperscript{15} Lodovico and his two brothers, Carolo and Rodolfo, followed in the footsteps of their father. For the catalogue of their misdeeds, see \textit{R. I. S.} 16. 790-800.
\textsuperscript{16} Magenta 1. 176.
\textsuperscript{17} See p. 48.
\textsuperscript{18} See p. 49.
APPENDIX A

LIONEL'S NAME AND TITLE

Whence did Lionel derive his name, and his title of Duke of Clarence? Let us inquire into the name first, and then into the title.

As to the name Lionel, the following theories are suggested by Sandford, p. 221:

This Lionel, named in Latin, Leonellus, Lionellus, and Leonatus, which signify, a Lionel, or Diminutive Lion, had this Appellation either from being the Off-spring of that Lion of England King Edward the Third (alluding to the Royal Arms he bare) whose Third Son he was, or to revive the British Name Llewellin, signifying Lion-like, being the same with Leominus or Leontius.

Here are two surmises: (1) Lionel means the son of Edward the Royal Lion; (2) Lionel is adapted from the Welsh Llewellyn. For the second of these there is nothing to be said. For the first, it is evident enough that Lionel is derived from 'lion,' but there seems no sufficient ground for assuming that Edward III was, in 1338, before the battles of Sluys, Crécy, and Poitiers, known as the Lion, in virtue of his personal prowess or the success of his arms, and as little for supposing that he derived this title from the animals on his shield, whether we call them lions or leopards.

These theories being rather unsatisfactory, let us ask ourselves whether we are bound to assume that the name was improvised for the occasion, or whether it already had a history. The French romance of Lancelot, in its prose form dating from about 1200, has a hero, Lionel, own cousin to Lancelot, the former

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1 Four manuscripts (N, R, C, M) of Murimuth (p. 87) read Leonem for Leonellum, as the name given to the prince at his birth, he is called Leo in the Cal. Pat. Rolls for May 20, 1343, and Froissart (Kervyn 7. 246-7), in his account of the journey to Milan, uniformly calls him Lion(s), Lyon; cf. the Lyons of Agravain (Romans 5. 303), and the Lyon of the Vœux du Héron (below, p. 120).

2 In the poems of Laurence Minot, Edward is more than once alluded to under the figure of a boar, and in the prophecies of John of Bridlington as a bull. See Political Poems and Songs, ed. Wright, Vol. 1.

3 Gaston Paris, Litt. Fr. au Moyen Âge, 3d ed., p. 109 (Romans 4. 191, assigns to it a date 12, 20, or 30 years earlier). An earlier form was in
being the son of Bohor (compare Tennyson’s Sir Bors), and the latter of Bohor’s brother, Ban. The two brothers had neighboring kingdoms near Saumur, in what was later Anjou, which they held as vassals of King Aramont of Brittany. Aramont recognized Uther, and afterwards Arthur, as his suzerain. A certain Claudas of Bourges, declaring himself vassal of the King of Gaul, invaded the territory of Lancelot’s father, who fled to England to implore the assistance of Arthur; but when he had departed, his castle was taken, and Ban soon after died. His brother, Bohor, survived Ban but a few days, and his kingdom, too, fell to the invader, Claudas. Lionel and his brother, named Bohor after his father, were left with their mother in Montecclair, the only castle that still remained of all that had belonged to their father; but even from this they were soon expelled by King Claudas. When Lionel and Bohor had grown to boyhood, an attendant tells them that by one of the sons of Ban and (the elder) Bohor the adventurous period of Great Britain shall come to an end, at which Lionel grows first red, then pale, and bursts into tears. This, he explains, is because Claudas still holds his father’s territories, whereupon Lancelot tells him that he will never want for lands if only he lack not courage.

Eventually, as we are informed in the romance of Agravain, Lancelot, who has regained his hereditary dominions, bestows upon Lionel the kingdom of Gaul.

Anglo-Norman, and was carried to Vienna by Gui de Morville, one of the hostages for Richard Coeur de Lion (before 1194).

4 As does the Vulgate Merlin (ed. Sommer), and the Dutch Lancelot, ed. Jonckbloet, pp. 228-230. See Weston, Legend of Sir Lancelot du Lac, pp. 52, 135-6, 143, 201.

5 Where the Angevin kings of England took the name of Plantagenets (Michelet 4. 191).

6 See Romans 3. 3-21.

7 Romans 3. 90-91; for other references to Lionel see pp. 27, 60-65, 67, 72, 84-89, 92-94, 110, 119, 127; 4. 1, 18-23, 45 ff., 76, 79, 144-5, 209 (dubbing of Lionel), 268-272, 320, 326, 330-332, 338-342; 5. 5-6, 118-120, 290-293, 295, 303, 314-5, 318-329, 323, 326, 334, 330, 351. (Cf. Le Morte Darthur, pp. 169, 170, 183-5, 190, 192, 196, 397, 585, 604, 612-3, 676-9, 682-6, 743-4, 818, 829, 855.) On p. 59 we are told: ‘Lionel était le cœur d’enfant le plus démesuré que l’on pût voir; aussi Galehault, le vaillant seigneur des îles foraines, le surnomma-t-il Cœur sans frein [cf. 4. 270], le jour qu’il fut armé chevalier.’

8 Romans 5. 323; cf. Le Morte Darthur, pp. 829, 855.
There are two reasons for the association of this mythical Lionel with the king of beasts—the circumstances which gave him his name, and an exploit which he performed in the days of his knight-errantry. When Lionel was born, there was seen on his breast a red spot resembling a lion, with paws outstretched as if to embrace his neck. The exploit, which Lionel craved for himself on the occasion of his dubbing as knight, consisted in the strangling of the first Libyan lion ever seen in Great Britain. It was led in, with a crown on its head, by a damsel who held it by a golden chain, and the reward of the emprise was to be the hand of the damsel’s mistress, the most beautiful and richest lady in the world. This exploit is of course to be disregarded in considering the reason why the Lionel of romance received his name.

But how can the Lionel of romance have influenced Edward III and Philippa in the bestowal of a name upon their third son? The answer to this involves a consideration of the circumstances and designs of Edward III in November, 1338, when Lionel was born. At that time one of the chief sources of England’s wealth was wool, which was chiefly exported to Flanders, and there manufactured into cloth. The prosperity of both countries therefore depended upon a free and uninterrupted exchange of their products, which, during the earlier years of Edward’s reign, was in danger of being prejudiced through French influence. To cultivate the friendship of the Low Countries, and to prevent the ascendency of the French in that quarter, was a policy which was almost forced upon Edward at this period. He had married Philippa, daughter of the Count of Hainaut, who was also Count of Holland and Zeeland, and Lord of Friesland; and this alliance was of great political advantage to him in his enterprises against France. The situation is summarily described by Coville:

Édouard III, suivant le conseil qui lui fut donné dans son Parlement, chercha de tous côtés des alliés sur le continent, jusqu’en

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9 See the quotation from Lancelot in Madden’s edition of Sir Gawayne, p. 313: ‘Et le varlet ait à nom Lyonnel pource que une grande merveille advint à son naistre. Car sy tost comme il yssit du ventre Helayne, sa mere, l’en trouva au meilieu de son pis une tasche vermeille en forme de lyon, et ait l’enfant embrassé parmy le col, ainsi comme pour l’estranglant.’

10 Romans 4. 272; 5. 290-293.

Norrêve et en Espagne, mais surtout aux Pays-Bas. Il avait épousé une fille du comte de Hainaut, comte en même temps de Hollande et de Zélande et seigneur de Frise; il était devenu le beau-frère de l'empereur Louis de Bavière et du comte de Gueldre. En 1328, puis en 1330, il s'était assuré l'alliance du duc de Brabant, dont le duché commençait alors à prendre son grand essor industriel. Avec l'aide de la maison de Hainaut-Hollande, dont les domaines avaient une grande importance stratégique, Édouard espérait dominer tous les Pays-Bas. Il est vrai que Philippe VI, à partir de 1332, essaya de contrecarrer l'action d'Édouard dans cette région; il obligea le duc de Brabant à faire alliance avec lui et à marier son fils aîné à une fille de France, et en 1334 il acquit la seigneurie de Malines. Mais Édouard II reprit bientôt l'avantage aux Pays-Bas.

In October, 1337, Edward took the title of King of France, in order to quiet the scruples of the Flemish. 12 In July, 1338, he installed himself at Antwerp with Queen Philippa, and spent money lavishly, in hopes to gain more completely the friendship of the people. 13 Now it was during this sojourn in Antwerp that Philippa gave birth, on Nov. 29, 1338, to the son who was called Lionel of Antwerp—just as his brother, born two years later, was known as John of Gaunt (Ghent)—after Edward III had been present at a parliament in that city, at which he granted to the Flemish great commercial privileges, and bestowed upon them the wool staple and a large subsidy. 14

Meanwhile, Edward was not only embroiled with the King of France on the grounds indicated above, but also because restitution had not been made of a part of Guyenne which had been seized by the French toward the close of his brother's reign. After this encroachment, Edward's vassals, whenever they were dissatisfied with his rule, were prone to appeal, over his head, to Philip VI, King of France. 15

Here, then, we have a situation sufficiently analogous to that outlined at the beginning of Lancelot—the vassals of an English

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12 Lavisse 4.1 39; Michelet 4. 185.
13 Lavisse 4.1 43. Froissart thus describes his prodigality (Michelet 4. 179-180): ‘Et n'épargnoient ni or ni argent, non plus que s'il leur plût des nues, et donnaient grands joyaux aux seigneurs et dames et demoiselles, pour acquérir la louange de ceux et de celles entre qui ils conversoient; et tant faisoient qu'ils lavoient et étoient prisés de tous et de toutes, et mêmement du commun peuple à qui ils ne donnaient rien, pour le bel état qu'ils menoient.’
14 Lavisse 4.1 44-45.
15 Lavisse 4.1 35.
king despoiled, and their territory appropriated, by the vassals of a French king; while, looking to the future, as in the romance the whole of Gaul, and not merely an individual fief, falls under the sway of the son (still an infant when the story opens) of a dispossessed lord, so, it may be inferred, when chivalry has done its perfect work, will this infant possess a heritage in the fair lands of France. The analogy seems to fail in one point, it is true; for who is the Lancelot at whose hands Lionel is to receive his appanage? But we do not expect, in these smiling forecasts, the strictest correspondence in every detail. The Lionel of romance is brave even to foolhardiness; and he is represented as consumed with grief at the wrong that has been done to his father and himself. Would not a fond and ambitious father trust that his newborn son would thus conduct himself as he grew toward manhood?

But what reason have we to suppose that the Lancelot would be thus familiarly known, or that a mere tissue of chivalric imagination would thus influence grave statesmen and ambitious warriors? As to the former, 'we have the testimony implied in the lines of Chaucer:

This storie is also trewe, I undertake,
As is the book of Launcelot de Lake,
That woomen holde in ful grete reverence.

16 Romans 3. 65.
17 Romans 3. 61: 'Ne vaut-il pas mieux mourir à honneur que d’abandonner à d’autres son héritage?' As he and his brother come riding to the court of Claudas, in obedience to his summons, they are thus met: 'À leur approche, tous les gens du palais sortent pour les voir. On les regarde avec intérêt, on pleure, on prie Dieu de les rétablir un jour dans leurs honneurs. . . . Lionel avançait la tête haute, promenant fièrement sa vue de tous les côtés de la salle, comme jouveneau de haut et noble parage' (3. 63-64). When he is about to be made knight, Arthur, who had been sojourning at Dinasdaron, gave rendezvous to his barons, for the feast of Pentecost, at his city of London, for he wished to dub young Lionel of Gannes knight in the presence of his whole court. 'Jamais il n’y eut une réunion si brillante de barons, de dames, et de demoiselles; on vint à Londres de toutes les villes non-seulement de la Grande-Bretagne, mais aussi de France, d’Allemagne, et de Lombardie' (4. 209).
18 Nun's Priest's Tale 391-3 (B 4401-3). Cf. Squire's Tale 279 (F 287): No man but Launcelot, and he is deed.

In Romans 4. 371-3 attention is called to the fact that the Lancelot comprehends the Galeotto of Dante, mentioned in the episode of Paolo and
Significant, too, is the fact that on June 15, 1378, Luchino Novello Visconti, son of Luchino (Corio, p. 482; R. I. S. 16. 753; Giulini 5. 470), who was to sail early in July with Valentina, daughter of Bernabò, to marry Pierre II, King of Cyprus (see p. 109), wrote to obtain ‘unum romanum loquentem de Tristano vel Lanzaloto, aut de aliqua alia pulcra et delectabili materia’; this was for pastime on the journey. As to the latter, we should remind ourselves that such seriousness in dealing with the matter of romance was by no means unexampled. Roger of Hoveden, writing at the beginning of the 13th century, tells us that Richard Cœur de Lion, being in Sicily in the spring of 1191, ‘gave Tancred that best of swords which the British call Caliburne [Excalibur], formerly the sword of Arthur, once the noble king of England.’ The Itinerarium Regis Ricardi, the chief European account of the Third Crusade, says of Richard: ‘His was the valor of Hector, the magnanimity of Francesca; that a subtitle for the Decameron was Il Principe Galeotto (cf. Hutton, p. 292, note); and that the Amadis of Gaul is largely indebted to the Lancelot (4. 371-3). One of Bernabò’s sons (b. 1356) was called Leonello (R. i. S. 17. 500), or Lionello. Commenting upon this fact, Rajna (Romania 17. 184, note 8) thinks there is no doubt that this is a direct allusion to the romance, and adduces in support of his view the names of other children of Bernabò: Lancilotto, Sagromoro, Palamede (Palamidese), Ettore (Astore), Galeotto; Isotta (Isolta), Ginevra (cf. Corio, p. 509; R. i. S. 17. 500). Even Galeazzo, according to Rajna (p. 182, note 2), is only another form of Galahad (which did not prevent the author of eight lines over the gateway of the Castello at Pavia from punning on the helmet there represented: ‘Hac galea Galeaz castrum defendit et urbem’; so Jovius, in Grævius, p. 315).


20 Archer, The Crusade of Richard I, pp. 48-49. Archer remarks (p. 48, note): ‘Though discarded by graver historians, such as William of Newburgh, the Arthurian stories soon worked their way deep down into the popular mind. In 1191, according to Ralph of Coggeshall, Arthur’s tomb was discovered at Glastonbury with the inscription: “Here in the valley of Avalon lies buried the renowned king Arthur.” The pervading influence of the legend may be seen in the fact that Arthur’s name was given to the posthumous son of Geoffrey, the third son of Henry II.’

21 Archer, p. 6, who adds: ‘The allusions here are to various chansons de geste which seem to have been favorite reading with this writer.’ Elsewhere the Itinerarium speaks of the period we still hear sung of in the “Gestes” about the famous victory of Boemund, of Tancred, Godfrey de Bouillon, and other noble chiefs of highest renown’ (Archer, p. 283,
Achilles; he was no whit inferior to Alexander, or less than Roland in manhood.' The chronicler Jean le Bel, whom Froissart follows in the earlier part of his work, when referring to the attack on Aiguillon, near Agen, by the elder Earl of Derby\(^{22}\) in 1346, compares it to the most famous sieges recounted in the stories of Alexander, Charlemagne, and Godfrey of Bouillon.\(^{23}\)

Of the castle of Chalkis, in Euboea, we are told\(^ {24}\): 'The local legend made it the abode of fairies, the enchanted fortress where the Lady of the Lake had held Gauvain captive.' And of Cephalonia,\(^ {25}\) on the authority of Froissart: 'Fairies and nymphs inhabited this ancient realm of Odysseus.' Elsewhere I have written\(^ {26}\): 'Mythical heroes are sometimes found in church-sculpture of the 12th century. Thus Arthur and other heroes of his cycle, recognizable by inscriptions, occur on the archivolt of the Peschiera doorway of the Cathedral of Modena (Venturi 3. 164; Michel 1.\(^ {2}\) 698), while on the portal of San Zeno of Verona, Nicholas represented Roland, with his sword inscribed Durindarda, and Oliver opposite (Venturi 3. 196; Michel 1.\(^ {2}\) 698). Even two episodes of the Roman de Renard occur on the lintel of the doorway of the Cathedral of Modena (Michel 1.\(^ {2}\) 698).' In the Vœux of the Heron,\(^ {27}\) John de Beaumont says that when knights are in taverns, drinking strong wines, they seem to themselves to be conquering Oliver and Roland, but that when they are on horseback, benumbed with cold, and with their enemies approaching, it is quite a different matter.\(^ {28}\) According to Jorga (pp. 24-25), Philippe de Mézières (1327-1405), the

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who says: 'The allusion here is to the great mediæval Chanson de Geste on the Siege of Antioch'). Again (Archer, p. 292): 'Out of all the "Gestes" of the ancients, and out of all the tradition of those who tell stories or write books from the most remote times, there never was a warrior of any creed who bore himself so nobly as King Richard did that day.' Finally, the Itinerarium refers to 'Richard, to whom Roland himself cannot be compared' (Archer, p. 311).

\(^ {22}\) See Hist. Background, pp. 176-7, 203, 219, 221-7, 237.

\(^ {23}\) Lavisse 4.\(^ {1}\) 58.

\(^ {24}\) Miller, p. 366.

\(^ {25}\) Ib., pp. 371-2.

\(^ {26}\) The Date of the Ruthwell and Bewcastle Crosses, p. 70, note 2.

\(^ {27}\) Political Poems and Songs, ed. Wright, i. 21.

\(^ {28}\) Michelet (5. 81) speaks of the future Charles VI as having (ca. 1380) his imagination spoiled by the romances of chivalry.
celebrated advocate of untimely crusades, shows, especially in his epistle to Richard II, much familiarity with the mediaeval accounts of the Trojan war, the twelve paladins, and the exploits of Alexander the Great, and compares Richard and Charles VI of France to Roland and Oliver, Charlemagne and Arthur.

Coming closer to Lionel himself, we have his great ancestor, Edward I, invoking the authority of legend against the claims of Scotland, as urged by Pope Boniface VIII. After relating the voyage of Brutus to Albion, where, after conquering and slaying the giants who possessed it, he renamed it Britain, and built the city of Trinovant, now called London, the great legislator continues:

> Item Arturus, Rex Britonum, princeps famosissimus, Scotiam sibi rebellem subjicit, et pene totam gentem delevit: et postea quendam, nomine Anguselum, in Regem Scotiae praefecit. Et cum postea idem Rex Arturus apud civitatem Legionum festum faceret celeberimum [sic], interfuerunt ibidem omnes Reges sibi subjecti, inter quos Anguselus, Rex Scotiae, servitum [sic] pro regno Scotiae exhibens debitum, gladium Regis Arturi detulit ante ipsum.'

Nothing could more clearly show how, in this century, the facts which history records may, on occasion, grow out of, or receive justification from, the legends which poetry invents.

But even Lionel in person was, so to say, cradled in romance. In a French poem, The Vows of the Heron, probably written soon after 1340, Queen Philippa is represented as looking forward to the birth of the future Lionel, and as making his very existence contingent upon the fulfilment of her husband’s vow to pass through Hainaut by way of Cambrai to the neighborhood of St. Quintin, carrying fire throughout the country, and making war upon King Philip if he dared the encounter. The following synopsis of the relevant portion of the poem is given by its editor:

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29 Rymer, under May 7, 1301.
30 Edward is represented as saying (cf. the remark of the Lionel of romance, above p. 114):

> Me cuide-il dont tolir më terre et mon pays?


31 Political Poems and Songs, ed. Wright, i. xii-xv.
One day in the September of 1388, Robert Artois, who was at the court of King Edward at London, took his falcon, and went hunting on the banks of the river, till he caught a heron. Robert returned to the palace, where he went direct to the kitchen, and caused the bird to be immediately cooked and prepared for the table. Now that day King Edward sat at dinner with his courtiers, occupied only with thoughts of love and gallantry, and harboring only peaceful and indulgent feelings towards all his neighbors, not excepting the king of France. Robert of Artois suddenly presented himself in the hall, followed by three minstrels and two noble maidsens, the latter of whom carried the heron ceremoniously laid between two dishes. Robert proclaimed that, as the heron had the reputation of being the most cowardly of birds, it was now destined for the greatest coward at the table, and that, he said, was King Edward, who submitted tamely to be deprived of the kingdom and crown of France, although he knew that they belonged to him by right. Having thus proclaimed his design, he presented the heron to the king, and, as was customary on such occasions, asked him to make a vow upon it. Edward, deeply stung by this reproach, made a vow that before the end of the year he would invade France with fire and sword, and that, if Philippe of Valois ventured to resist him, he would fight him, though he came with an army which was ten times the number of his own. Robert was overjoyed at the king's vow, and repeated to himself in undertones the hopes he had of revenging his own quarrel with King Philippe in the war which was about to commence; and then, after making his own vow, carrying the heron in the same ceremony, he proceeded to collect the vows of the other guests. . . . Robert of Artois presented himself in the last place before the queen of England. She first excused herself on the ground of being a married woman, but, on receiving permission from the king to do so, she uttered a vow which was not very remarkable for its feminine delicacy. . . . The heron was now carved, and shared among the guests; and soon afterwards the king made his preparations for his first campaign on the Continent. . . . The allusion to the captivity of the earl of Suffolk proves that it cannot have been composed before the year 1340.\(^2\)

The following lines are those which refer more immediately to Lionel\(^3\):

Adonc dist la roine: 'Je sais bien que piecha
Que sui grosse d’enfant, que mon corps senti la,
Encore n’a il gaires qu’en mon corps se tourna;
Et je voue et prometh à Dieu qui me crea,

\(^2\) The *Vows of the Heron* is modeled upon the *Vœux du Paon* (1310-1315), for which see Gaston Paris, *Litt. Fr. au Moyen Âge*, 3d ed., p. 80.

Appendix A

Qui nasqui de la vierge, que ses corps n’empra,
Et qui morut en crois, on le crucifia,
Que jà li fruis de moi de mon corps n’istera,
Si m’en arés menée ou pais par delà,
Pour avanchier le veu que vo corps voué a.
Et s’il en voeh isir, quant besoins n’en sera,
D’un grand coutel d’achier li miens corps s’ôchira;
Serai m’asme perdue et li fruis perira.\(^{34}\)

Adonc, quant che fu fait, li rois s’apareilla,
Et fit garnir les nes, la roine i entra,
Et maint franc chevalier avecques lui mena.
De illoc en Anvers li rois ne s’arreta.
Quant outre sont venu, la dame delivra;
D’un biau fils gracieux la dame s’acouka,
Lyon d’Anvers ot non quant on le baptisa.
Ensi le franque dame le sien veu aquitta.\(^{34}\)

The theory we have sketched concerning the source of Prince Lionel’s name derives an added plausibility when considered in the light of his title, Duke of Clarence. It has usually been supposed that this title was derived from the possessions of Lionel’s first wife, Elizabeth, at Clare in Suffolk,\(^{35}\) her uncle having been Gilbert, Earl of Clare and Gloucester. Thus Sandford\(^{36}\): ‘Duke of Clarence, as it were of the Country about the Town, Castle and Honour of Clare.’\(^{37}\)

The matter is complicated by the existence in the Middle Ages of a town called Clarentza\(^{38}\) (Glarentza), on the coast of Elis,

\(^{34}\) On April 16, 1358, the Dauphin Charles, afterwards Charles V, pays for the repair of a piece of tapestry, representing the vow of the heron (\textit{panni lancei ad ymagines super voto Hardeci}), which had been torn in his room by a favorite bear (Delachenal i. 64).

\(^{35}\) See pp. 91 ff.

\(^{36}\) P. 222. Sandford says that Clarenceaux king-at-arms, being provincial herald for the region south of the Trent, was named from this duchy.


\(^{38}\) Cf. Leake, \textit{Travels in the Morea} 2. 173-4: ‘Glaréntza, softened by the Italians into Chiarenza, once gave name to a Venetian duchy. . . . It is now only a desert harbor, where some rocks furnish a retreat for boats. There can be no doubt that Glaréntza is the ancient Cyllene.’ Other particulars are given by Longnon (\textit{Chronique de Morée}, pp. XCIX-CI): ‘Clarentza was the port of Andravida, the capital of the principality of Achaia, and distant from it three leagues to the westward. The Franks created the new seaport (now filled up) on the site of the earlier St. Zacharia, and named it from the clear waters issuing from the fountain.
nearly opposite the island of Zante (Corfu), from which some have supposed the title to have been derived. This opinion is thus combated by Leake:

An unfounded opinion has long prevailed, and has been repeated by some of the latest travellers, that the name of the English dukedom of Clarence was derived from Glarenza or Klarenza, the modern name of Cyllene. But no royal or noble family of England is known to have possessed any territory in the Peloponnesus, and there can be no question, that Clarentia or Clarencia was the district of Clare, in Suffolk. The title was first given in 1362, by Edward III., to his third son Lionel, when the latter succeeded to the estates of Gilbert, earl of Clare and Gloucester, uncle to his wife, who was heiress also to her father, William de Burg, earl of Ulster. On Lionel's death, the title became extinct for want of heirs, and was thrice renewed with the same result: in 1411, by King Henry IV., in favour of his second son, Thomas Plantagenet; in 1461, by King Edward IV., in favour of his brother, George Plantagenet; and in 1789, by King George III., in favour of his third son, William Henry. Κλαρέντια, Κλαράντια, or Κλαρέντια, is a name found in other parts of Greece, and appears to be derived from the Romaic Γλάρος, a water-fowl so called. It is possible that this error as to the title of Clarence may have been partly caused by the identity of the Latin form of the name of the two places, although so widely distant from one another.

The views of Leake have been traversed by Sir Rennell Rodd:

It has been maintained that after the marriage of Florence of Hainault with Isabella Villehardouin, the family of the counts of Hainault took a title from the Achaian city of Clarenza, and that through Philippa of Hainault, the wife of Edward III., it was revived in favour of her son Lionel.

of Cyllene. It was the place of disembarkation for reinforcements arriving from France and the kingdom of Naples, and destined for the Morea. It was, too, the resort of foreign merchants, especially the Venetians, and a place of considerable commerce; and its citizens formed a financial aristocracy. The local French fleet was under the control of an admiral, and the money coined here was esteemed throughout the Orient, as the weights and measures of Clarentza were recognized as standard in all Romania.' See also Leake, Peloponnesiacæ, pp. 210-211; Rodd i. 110, 141, 173-5, 266; 2. 3. 18, 30, 34; Miller, pp. 267-8, 272, 289, and Index s. v. Glarentza; Boccaccio, Decameron 2. 7; Ptolemy, Geographia, ed. Noble, 3. 16. 6 (where later manuscripts record that Cyllene was subsequently known as Klarenza).

39 Peloponnesiacæ, p. 212.
40 2. 275-6.
Buchon, Hopf, and others have accepted the popular tradition. Colonel Leake, on the other hand, throws doubt upon it, maintaining that the English title of Clarence was derived from the district of Clare in Suffolk, and was borne by Prince Lionel on his succeeding to the estate of Gilbert, Earl of Clare and Gloucester, uncle to his wife (Peloponnésiaca, p. 212). Leake found the name Πλάριτ'α or Πλάριτ'α existing in other parts of Greece, and derives it from the Romain name of a waterfowl, Πλάρ. The tradition, however, which connects an English prince with the adventurers of the thirteenth century in the Morea has a fascination which one is reluctant to abandon, and it is conceivable that the name had a double significance as bestowed on the son of Philippa of Hainault.

Lionel, Duke of Clarence, died in 1360. If the title had been a new one created especially for this prince, and derived from Clare in Suffolk, it might be contended that a contemporary writer would hardly have chosen it to give to a knight of King Arthur’s court. On the other hand, the legends which had gathered round the conquest of Morea and the acquisition of principalities in the Levant would more readily justify the association with the round table of a name derived from the crusading epoch which developed the spirit of adventure and chivalry crystallized in the Arthurian romance.

What shall we say to these opposing views? Was Lionel’s title derived from Clare in Suffolk, or from Clarentza in the Peloponnésus? Those who advocate the latter opinion argue as follows: The title to Clarentza descended from William of Villehardouin (1245?-1278) to his daughter Isabella (1289-1307), and from her to her daughter by Florence (Florent) of Hainaut, Mahault (1313-8), from whom it passed (conjecturally) to Philippa of Hainaut, queen of Edward III, who transmitted it to Lionel.

42 Cf. Rodd 2. 2-3; Miller, pp. 205-6.
43 Rodd 2. 19, 33, 143 ff., 148, 154-5, and Appendix III; Miller, pp. 190, 206, 252, 256-8.
44 As Lionel named his daughter (and only child) Philippa, it may be surmised that there was a peculiar attachment between him and his mother. Lionel’s daughter gave the same name to a daughter of her own (b. Nov. 21, 1375). Her next child, Edmund (b. Nov. 9, 1376), named a son Lionel.
45 It is curious how a nominal Prince of Achaia was summoned by Lionel to appear before his tribunal in Milan, six days before his marriage. See p. 90.
Those who take the trouble to follow the career of Mahault of Hainaut to the end will see that it was only a barren title that she had to bestow, and that, such as it was, it could not have passed by direct and valid descent to Lionel of Antwerp. How far it was connoted, as a mere reminiscence, in the naming of the young prince, is another matter.

But even granting the reminiscence, we have still to inquire how a town in Greece came to have such a manifestly occidental name as Clarentza (for the derivation suggested by Leake evidently does not account for more than the first syllable, and is problematical enough for that). Here we are assisted by a piece of collateral evidence. The citadel of Clarentza, built in the first quarter of the 13th century, a work which it required three years to construct, was named Clairmont, a word which, by a transposition of its syllables, becomes Montclair, which at once reminds us of the castle of Monteclair where the mother of the mythical Lionel had taken refuge with her two sons when their country was ravaged by Claudas. It need not surprise us, then, if the name of Clarentza recalls a personage of the Roman de Lancelot. Such a personage there was in the Duke of Clarence to whom we are introduced in the Lancelot, where, after the banquet on the occasion of Lionel's initiation into knighthood, four renowned knights of the Table Round take their way to the forest of Varannes, not far from the Thames, these four being Gawain, Ywain, Lancelot, and Galeschin, Duke of Clarence, the son of Tradelinan, King of North Wales, brother of Dodinell le Sauvage, nephew of King Arthur, and

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46 Rodd i. 132-3, 137; Miller, pp. 87-88.
47 Miller, p. 87. See the descriptions in Rodd i. 135-7, 174-5 (with plan).
48 Romans 3. 35, 37; cf. p. 114, above.
49 Malory spells the name in a variety of ways, none closely resembling this: Chalanne, Chalenge, Challyns, Chaleyns; cf. Le Morte Darthur, pp. 484-5, 491, 766, 790.
50 Madden describes the Duke of Clarence (Sir Gawayne, p. 313) as 'son of Neutres, King of Garlot, by a sister of Arthur, and cousin of Dodinel. The duchy was given to him by Arthur, after his marriage with Guenever. The author of Merlin says of him, "Cest enfant fut le meilleur chevalier de deux centz cinquante chevaliers qui furent de la Table Ronde."
own cousin to Gawain.51 A knight of such noble lineage, thus accompanied and thus distinguished, might well become famous among the chivalrous readers of romance, and thus lend his name to a principality founded by invaders from France.52

The Duke of Clarence and Lionel, as well as Lancelot, Bors, Bedivere, and the brother of the Duke of Clarence, Dodinel le Sauvage, are associated in Gawain and the Green Knight53 552-4:

Syr Dodinaval de Savage, þe duk of Clarence,
Launcelot, and Lyonel, and Lucan þe gode,
Syr Bors and Sir Bydver.

This, and the quotation from Chaucer with respect to the Lancelot,54 may avail to show that, in the last half of the 14th century, the romance was well known in England, as we may infer that it was in the Morea in the first quarter of the 13th century. And these, together with the analogies adduced above,55 will perhaps serve to establish the presumption that both the name and the title of King Edward III's son were derived from the Lancelot, at a period when the Table Round was strikingly recalled to men's minds by the establishment of the Order of the Garter (1348, or somewhat earlier).

But where, after all, was the original duchy of Clarence? Perhaps in faerie, or in a country sufficiently near to it; for the romancer,56 apropos of Lancelot's battle-cry, 'Clarence!

51 Romans 4. 210. For Galeschín's adventures, see 4. 213-246, 293, 297, 300-311, 313, 328. He is described as short and stocky, but bold, alert, and of marvelous prowess.

52 Cf. Rodd 1. 176: 'By a strange irony of fate a Lombard marquis was warden of the pass of Thermopylae, a knight of Flanders was lord in seven-gated Thebes, and a Venetian adventurer ruled over the Cyclades.' Miller (p. 87) quotes from the Venetian, Sanudo: 'He possessed a broad domain and great riches; he was wont to send his most confidential advisers from time to time to the courts of his vassals, to see how they lived and how they treated their subjects. At his own court he constantly maintained eighty knights with golden spurs, to whom he gave all that they required, besides their pay; so knights came from France, from Burgundy, and, above all, from Champagne, to follow him. Some came to amuse themselves, others to pay their debts, others because of crimes which they had committed at home.'

53 Ascribed to about the time when Lionel received knighthood.

54 Above, p. 117.


56 Romans 4. 76.
l'enseigne au roi Artus,' remarks: 'Clarence est une cité de Norgalles, grande et plantureuse, où jadis avait résidé le roi Taulas, aïeul d'Uterpendragon. De là le cri que ses descendants avaient conservé.'

The mythical Clarence of a legendary North Wales, the Clarentza of a chivalrous emprise in Greece, the Clare of Suffolk—are all these blended, then, in Lionel's title? However that may be, it would seem that, had it not been for the Roman de Lancelot, we should have known Chaucer's earliest patron neither as Lionel nor as the Duke of Clarence.\footnote{See Hist. Background, p. 185.}
APPENDIX B

CHAUCEB'S ALAUNTS

In his description of Lycurgus, King of Thrace,¹ Chaucer tells us (K. T. 1290-94):

Aboute his char ther wenten whyte alaunts,
Twenty and mo, as grete as any steer,
To hunten at the leoun or the deer,
And folwed him, with mosel faste ybounde,
Colers of gold, and torets fyled rounde.

What were these alaunts, and whence did Chaucer derive his acquaintance with them?

The first extended account that we have of this species of dog is contained in the treatise on hunting written by Alfonso XI of Spain, or under his direction, between 1342-50²:

Las fechuras que debe haber el alano para ser fermo son estas; que haya la cabeza de talle de congreso, et bien cuadrada, et bien seca, et la nariz blanca, et bien abierto de boca; et las presas grandes, et los ojos bien pequeños, et que cante bien á la nariz; et las orejas bien enfiestas, et bien redondas; pero que esto de las orejas todo vá en el que lo faña en facergelas bien tajadas, ó mal; et que haya el cuello luengo; pero que se sigua bien, que non sea muy grueso, nin muy delgado; et que haya los pechos bien abiertos, et los brazos que los haya bien enfiestos, et non delgados, et la cuartilla pequeña, et las manos redondas, et altas, et el arca colgada et grande, et que non se le parezcan las tetas; et que haya el lomo bueno, et non cargado en las caderas, et que se le parescan á mala vez los huesos del espinazo; et la cola que sea mas contra gruesa que contra delgada, et que sea bien espigada, et que la traiga bien; et las corvas que las haya bien anchas, et bien arregazadas, et los pies que se siguan con las manos, et que sea de buen cabello, et blando, et de cuerpo que non sea muy grande sin razon. Et el alano que estas fechuras hobiere, será fermo, et de razon debe seer tomador.

La alana que sea mas aguda de rostro, et que non haya tamaña boca como el alano; et que haya los ojos pequeños, et un poquiello

¹ The home of Mars (cf. K. T. 114-6); see Homer, Il. 13. 301; Od. 8. 361; Sophocles, Antig. 970; Virgil, Æn. 12. 331 (cf. 3. 13); Statius, Theb. 7. 6 ff., 35 ff.; etc. Chaucer assigns to Thrace the hunting of the lion and the bear, where Statius (Theb. 4. 494-5) refers the hunting of the lion to Morocco (cf. Boccaccio, Tes. 7. 106, 119).
² Gutierrez de la Vega (see below), pp. XLII-XLIII. For Alfonso at Algeciras, see Hist. Background, pp. 217 ff.
longuetes, pero que cate á la nariz, et que sea mas luenga de costados, et que haya mayores caderas, et que non sea tan abierta de pechos, et en todo lo al que sea de las fechuras del alano.

Las mas finas colores que Nos fallamos de los alanos, et de las alanás son los blancos, et los grises escuros, et los prietas, et aun blancos manchados, en tal que hayan dos, ó tres manchas, et que sean grises, ó prietas, et que las hayan en la cabeza, ó sobre la cola; pero tambien de sabuesos como de alanás por non ser muy lindos de fechuras, nin de colores, acaesce á las veces que hay algunos que son buenos de bondat, empero mas de razon es comunamente de los que fueren lindos, et hobieren buenas fechuras, et buenas colores salir mas dellos buenos que non de los otros. Et á dó se ayunta la bondat et la fermosura, et ser lindo, es la bondat doblada.8

3Libro de la Monteria, ed. Gutierrez de la Vega, pp. 115-8 (chap. 41).
Another passage is (pp. 6-7):

'Otrosi los alanos es cierta cosa que non toman por fambre nin por premia salvo por naturaleza derecha, que les dió Dios, et aridéza de corazon sobre todas las animalías. Et aun los muy lindos dellos con lealtad non tan solamente tomará el alano lindo cualquier venado á quel pongan; mas aun si mandare tomar aquel á qui conosiere, á un home armado, tomarlo ha. Et probado fué muchas veces que muchos alanos ayudaron á los que los criaban contra sus enemigos et se defendieron dellos por ayuda de alanos. Et es verdad que tambien de sabuesos como de alanás, que si non fuese porque les faria mal el grant afan sobrel comer, que toda cosa que á ellos pertenesce de facer, farián mejor después que gobernados que antes. Et asi se prueba que todo lo que facen en su oficio, que lo facen por naturaleza de omecillo que puso Dios entrellos et los venados, et por talante que han de lo facer, et non por fambre, nin por otra premia ninguna.'

And still another has reference to the breeding of the alaunt (pp. 110-1; chap. 39):

'Para haber buenos alanos, deben facer desta guisa. Cuando tovieran muy buen alano et bien lindo, et fermoso, et bien tomador, debel catar una alana que sea desa condicion mesma, et apartarlos ambos de la guisa mesma que de suso dice que aparten á los sabuesos, et facer á ella esa mesma guarda. Et de que pariere, dejarle dos, ó tres fijos, á lo mas, et los otros darlos á criar á otras alanás, ó á lebreras, ó á mastinas las mas lindas que fallaren. Et desde que hobieren medio año, criarlos sueltos, et non usarlos atar, porque se facen los brazos tuertos; pero guardarlos de andar lo mas que pudieren mientras son tiernos; et requerirlos con leche, porque los trae sanos et sencielllos. Et quando hobieren medio año, despuntarles bien las orejas, porque desde que son fañados, traenlas siempre mejor et mas en fiestas. Et criarlos desta guisa fasta que hayan un año. Et de un año adelante traerlos siempre consigo en palacio, para
Appendix B

It might be inferred from the foregoing that the home of the alaunt was in Spain, and this view is confirmed by the fact that in the time of Gaston de Foix (see below) it was proverbial that greyhounds came from Brittany, and alaunds and bird-dogs from Spain⁴; moreover, we are told by Commines that Louis XI (1461-83) had alaunds brought from Spain.⁵

As Foix is so near to the Pyrenees, it is not surprising that the next authority on the alaunds is Gaston de Foix (1331-1391), surnamed Phœbus,⁶ son of the Gaston II who fought at Algeciras in 1343.⁷ That Gaston Phœbus was fond of the chase may be deduced from the fact that he kept 1600 hounds.⁸ The full title of his famous book, written between 1387 and 1391, is Déduits de la Chasse des Bestes Sauvages et des Oiseaux de Proye. It has been published by Joseph Lavallée (Paris, 1854), as La Chasse de Gaston Phébus.⁹ The part that concerns the alaunt here follows, with certain changes in punctuation (pp. 100-102):

Alanz est une nature et manière de chiens¹⁰; et les uns sont que on appelle alanz gentilz, les autres sont que on appelle alans veautres. Les autres sont alans de boucherie.

Les alans gentilz si doivent estre fez et taillez droitement comme un levrier de toutes choses fors de la teste, qui doit estre grosse et courte.¹¹ Et combien qu’il en y ait de chescun poill, le droit bon poil de alant, et qui plus est commun, si doit estre blanc, avec aucune

acostumbrarlos, et emponerlos en el tomar; pero guardarlos de grand afan, fasta que hayan dos años, ó año et medio á lo menos, que non lo lleven á monte.'

Cf. Leighton (p. 86) on the breeding of the Great Dane.

⁴De Noirmont 2, 294.
⁵Ib. 1, 112.
⁸Baillie-Grohman, p. xxx.
⁹There is a cheap reprint, Paris, 1897.
¹⁰Cotgrave (Dictionarie, 1632) describes the Allan as ‘a kind of big, strong, thicke headed, and short snowted dog, the brood whereof came first out of Albania.’ To Florio it is simply ‘a mastive dog.’
¹¹Cotgrave says it is ‘like a Grayhound in all properties and parts, his thicke and short head excepted.’
tache noire environ l'oreille; les yeulz bien petiz et blans, et les nar-

Alan faut mieulz acoustumer que nulle autre beste, quar il est
mieulz tailleé, et plus fort pour fere mal, que nulle autre beste; et
aussi de leur nature les alans sont voulentiers estourdiz, et si n'ont
mie si bon sens comme moult d'autres chiens ont: quar se on court
un cheval ils le prennent voulentiers, et vont aux buefz, ou brebis,
or pourcialx, ou à autre bestiaill, ou aux gens, ou à autres chiens
(quar j'ay veu alant qui tuait son maistre); et en toutes guises alans
sont mal gracieux et mal entechiez, et plus foulez et estourdiz que
autre maniere de chiens. Et onques je n'en vi trois bien entechiez
et bien bons; quar bon alant doit courre si tost comme un levrier, et
cé a quoy il ataint il doit mettre la dent; et ce doit estre sans leissier,
quat un alant de sa nature tient plus fort sa morsure que ne feroient
trois leveurs—les meilleurs que on puisse trouver. Et pour ce est ce
le meilleur chien que on puisse tenir pour prendre toutes bestes à
tenir fort. Et quant il est bien duit et parfaictement bon, je tiens
que c'est le souverain de tous les autres chiens; mes pou en trouve
en de parfet.

Bon alant doit amer son maistre, et suyvir et luy aidier en tous
cas, et fere ce qui li commendera, queuechose que ce soit. Bon
alant doit aller tost, et estre hardy à prendre toute beste sans mar-
chander, et tenir fort sans leissier, et bien aconditioné, et bien à com-
mandement de son maistre; et quant il est tel, je tiens, comme j'ay
dit, que c'est le meilleur chien qui puisse estre pour prendre toute
beste.

L'autre nature d'alans veautres si sont auques taillez comme leide
taille de levrier; mes ils ont grosses testes, grosses levres, et granz
oreilles[3]; et de cez si s'aide l'en très bien de chassier les ours et

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[3] Cotgrave defines it as a 'great & ougly curre of that kind (having
a big head, hanging lips, and slowching cares), kept onely to hunt the
Beare and wild Boare.' Elsewhere (under Vaultre) he characterizes it
as 'a mungrell betweene a hound and a mastife, or of a size between the
Allan and great courtrie curre; fit for the chase or hunting of wild Beares
and Boares.' Godefroy (Diet. de l'Ancien Français, s. v. Veltre) defines
it as a 'sorte de chien employé surtout pour la chasse de l'ours et du
sanglier.' De Noirmont (2. 297) identifies this with the Spanish alano
described below by Alonso Martinez de Espinar (Arte de Ballesteria y
Monteria, 1644), the ancestor of the Cuban dogs, and of those which are
trained by the Spaniards to fight with bulls: 'He is large, his limbs strong,
his muzzle blunt, his forehead straight and broad, his eyes round and
bloodshot, his aspect terrible, and his neck short and thick; his strength
is such that he can conquer an animal as valiant and ferocious as the
bull.'

For bear-hunting in the Pyrenees and in Spain, see De Noirmont 2.
481-4.
les porcs, quar ilz tiennent de leur nature fort; mes ils sont pesans et lez, et s'ils muerent d'un sanglier ou d'un ours, ce n'est mie trop grande perte. Et meslez avec levrers qui puissent, sont bons, quar, quant ils ateinht, ils lient la beste et la tiennent tout quoy; mes par culx mesmes ils ne l'ateimdroient ja, se levrers ne metoient la beste en destri. Donc tout homme qui vuelt hanter la chasse des ours et des porcs doit avoir et levrers et alanz veautres ou de boucherie (et mastins si n'en puelt avoir des autres), quar fort tiennent, comme j'ai dit, plus que levrers.

L'autre nature d'alans de boucherie sont tels que vous pouvez veoir tousjours ès bonnes villes, les quicux les bouchers tiennent pour leur aidier à mener les bestailz qu'ils achentent hors des bonnes villes; quar si un buf eschapoit du bouchier qui le maine, son chien le va prendre et arrester14 jusques tant que son mestre soit venu, et l'aide à ramener à la ville. Et sont de pou de despenz, qu'ilz menjent les ordures des boucheries; et aussi gardent ilz l'hostel de le mestre, et sont bons pour la chasse des ours ou des sangliers, ou soit avec levrers au titre,15 ou soit avec chiens courans aux abois dedenz les fourz; quar quant un sanglier est en 1 fort pais, ja de tout le jour par aventure ne le vuideroit pour les chiens courrans. Et quant on gete ciei mastinaille, ou ilz le prennent en my le fors, et le font tuer à aucun homme, ou ilz lui font vuider le pais, qu'il ne demourra gueres longemeuent aux abois. Et aussi sont ilz bons pour veautrer de nuiz, si comme je diray quant parleray du veneur.

As the original is somewhat repetitious and confused, a condensed summary, with a redistribution of the matter, is here presented:

There are three species of alaunts—gentle alaunts, voltres, and butchers' alaunts, the last being the least esteemed.

Nearly all alaunts have bad dispositions, and are harebrained and selfwilled. No other dog can equal an exceptional alaunt, if perfectly trained. A thoroughly good alaunt must be as fleet as a greyhound, fearless, fond of his master and close at call, obedient, prompt in seizing his prey, and tenacious of his hold. No dog is so well built, and none so strong to do harm; neither is any so ready to attack—whether it be horse, ox, sheep, hog, a human being, or another dog. Therefore, since an alaunt is as strong in the jaws as any three greyhounds, and has on occasion been known to kill his own master, it is evident that he needs the most thorough training. Even then,

14 Cotgrave says it is 'like our Mastive, and serves Butchers to bring in fierce oxen, and to keepe their stalls.'

15 The titre was an arrangement for so surrounding the game as to leave but one passage open, on issuing through which the animals were attacked by relays of hounds.
a man must have had a very large experience of dogs if he has seen three first-class alaunts in all his life.

The gentle alaunt is built exactly like a greyhound, except that he has a short, thick head.

The veltre is formed like an ill-shaped greyhound, only with a big head.

The butchers' alaunt is not particularly described as to his appearance.

The gentle alaunt has straight and pointed ears, rendered sharper by cropping. The veltre has large ears and large lips.

The gentle alaunt is preferably white, touched with black about the ears. Its nostrils are white, and its eyes white and very small.

The veltre serves a good purpose in the chase of the bear and wild boar, but is too heavy and slow for the pursuit, and therefore needs to be supplemented by the greyhound. The greyhounds come up with the quarry, and keep it at bay till the veltres seize it. In default of veltres, butchers' alaunts may be used for this purpose.

The chief use of butchers' alaunts is to capture and hold an animal, such as an ox, that is running away; they are also employed as watchdogs, and as a substitute for veltres in the chase.

In the book called The Master of Game, written by Edward, second Duke of York, probably between 1406 and 1413, the chapter on the alaunts is translated, with minor variations, from that by Gaston de Foix. This chapter is as follows, the chief variations being indicated by italics, the punctuation somewhat improved, and an occasional emendation suggested in square brackets:

Alaunt is a maner and nature of houndes, and he good alauntz ben he [bo?] which men clepyn alauntz gentil; other he byn hat men clepyn alauntz veutreres. Ofer byn alauntz of he bocherie. Thei hat ben gentile shuld be made and shape as a greyhounte, eyvn of alle pinges sauf of he heved, he whiche shuld be gret and short; and poue ther [byn] alauntes of alle heves, he verrey hue of he good alauntz is moost comon shuld be white, wi a blak spott about he cery, smale [and white] eyne, and white stondyng eres and sharpe above.

Men shuld teche alauntz bettir, and to be of better custumes, han eny ope beestis, for he is bettr shape, and strenger for to do harme, han eny ope beest. Also comonly alauntz byn stordy of here owyn

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17 Chap. 16.
19 Equally in all respects.
20 Stubborn, headstrong, dogged, unruly; cf. 'sturdy beggars.' The alaunt has been compared to the Great Dane (see p. 136), of which Leigh-
nature, and have not so good witte as many oþer houndes have; for if a man prik an hors, þe alaunt wil gladly renne and bite þe hors; also þei renne at oxen, and at sheepe, at swyne, and to alle oþer beestis, or to men, or to oþer houndes, for men han seyn alauntz sle here maystire. And in alle maner wise alauntz bryn julþy felle, and evel undirstondyng, and more foolish and more sturyd þan eny oþer maner of houndes. And men seyn never þre wel condicions [condiciond] and good, for a good alaunt shuld renne also fast as a grei-hounde, and eny beest þat he myst come to he shuld hold wiþ his sesours and nouþt leve it, for an alaunt of his nature holdeth faster his biteng þan should iii greihoundes þe best þat eny man may fynde, and þerfore it is þe best hounde for to hold and for [to] nyme al maner beestis, and hold mystely. And whan he is wel condicond and perfitly [good], men hold þat he is good amonge al oþer houndes; but men fynden but fewe þat doon [rather, byn] perfit. A good alaunt shuld love his maistire, and folowe hym, and helpe hym in alle cace; and what þing his maister wold hym comaunde he shuld do. A good alaunt shuld goo fast, and be hardy to nyme al maner beestis wiþout turnyng, and hold fast and not leve it, and wel condicond, and wel at his maistra comandaunce; and when he is soche, men hold, as I have saide, þat he is oon þe good21 hounde þat may be for to take al maner beestis.

That oþer [65] nature of alauntz is clepid veunteres. Almost þei bene shapen as a greyhounde of ful shap, [but] þei han grete hedes, and greet lippes, and greet eeres; and wiþ such men helpeþ hem22 at þe baiyng of a boole and atte huntygne of a wilde boor. þei holde fast of here nature, but þei bryn [heavy] and foule, and þif thei] ben slayn wiþ wilde boor or wiþ þe bulle, and [om.] it is not ful grete losse. And23 wher þei may overtake a beest, þei biten and holden hurle stille; but by hem selþ þei shuld neyth holde þe beest, but þif þe greihoundes were withe hem, for to make þe beest tarye.24

That oþer nature, of alauntz of þe bocher[i]e, is soch as ye may alle day see in good times [tonnes], þat bryn called greet bouchers housdis, þe which bouchers holde25 for to helpe hem to bryng here beestis þat þei bryn26 in þe cuntre; for, þif an oxe escapid from þe boochers þat leden hym, his houndes wold go take hym, and holde hym to27 his master were come, and shuld helpe hym to belynge [brynge] hym

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21 The best.
22 Themselves.
23 A portion untranslated.
24 Keep.
25 Buy.
26 Until.

ton says (p. 86): 'With almost the strength of a tiger he combines the excitability of a terrier, and no doubt a badly trained Great Dane is a very dangerous animal.'
The Alaunt as a War-Dog.
agayn to þe toun. þei bryn of litel cost, for þei etyn þe foule þinges in þe boochiers rowe, and also þei kepen her maisters hous. þei bryn good for þe batynge of þe hole and huntyng of þe wild boore, whedir it be with greihoundis at trustre27 or with rennyng houndis at abbay wip inne þe covert; for whan a wilde boor is wipinne a strong hatte of wood, peraventure of [om.] alle þe day he wil not voide þennys for þe rennyng houndes. And whan men lat soche mestifs renne at þe boor, þei taken hym in þe thik spoyes28 and make some men slee hym, or þei make hym come out of þe strenght, þat he ne shal abide long at abaiies.28

The following account of the alaunt is given by Baillie-Grohman (pp. 115-6):

A strong ferocious dog,29 supposed to have been brought to Western Europe by a Caucasian tribe called Alains or Alani.30 This tribe invaded Gaul in the fourth century, settling there awhile, and then continued their wanderings and overran Spain. It is from this country that the best alans were obtained during the Middle Ages, and dogs that are used for bull- or bear-baiting there are still called Alanos.31 Gaston de Foix, living on the borders of this country, was in the best position to know such dogs, and to know all about them. His description, which we have here, tallies exactly with that written in a Spanish book on hunting of the fourteenth century. This book, Libro de la Monteria, was written by Alphonso XI. Both Gaston and this Spanish king say that the body of the Alaunt was like that of a heavy greyhound, their eyes were small, they were square in the jaw, and that their ears were trimmed and pointed to make them look alert. The tail was rather large than small. They were of three colours, white, grey, and blackish, but that white with black markings near the head and above the tail were the best liked. Alauntes were used as war dogs,32 and it was said that when once they seized their

\[27\] Tryst.
\[28\] Coppice, thicket.
\[29\] De Noirmont (2. 538) divides hunting-dogs into three classes: (1) Powerful dogs (chiens de force), including the wolfhound, mastiff, and bulldog, as well as the alaunt; (2) Greyhounds; (3) Running hounds; (4) Bird-dogs.
\[30\] Diez (Etym. Wbch. 1. 12) thinks that alaunt means Albanian dog.
\[31\] Similarly in the Spanish dictionary of Barcia, under the word Alano (I translate): 'The alaunt was so named because he was very fierce and bloodthirsty, like the barbarians who invaded Spain at the beginning of the fifth century. Hence this species of dog was employed in the hunting of wild boars.' Cf. Leighton, p. 511.
\[32\] I insert a picture taken from the Magasin Pittoresque 23 (1855). 221, which reproduced it from the Tractatus de Re Militari et de Machinis Bellicos (1330-40) of Paul Savetinus Ducensis, a manuscript of the
prey they would not lose their hold. An Italian MS. of the fourteenth century says that Alans that are to be set on cavalry should be trained by their masters to be ferocious and "biting" (Ducange; Wynn, "Brit. Mastiff," p. 48; De Noir. ii. 398 [298]).

As to the general appearance of the alan gentil, De Noirmont\(^3\) compares it to the Great Dane or German boarhound, to which he assigns a height of 30 to 32, or, exceptionally, 34 inches; but Chance, the Great Dane whose picture is here reproduced, ‘stood fully 35 inches at the shoulder, and was perhaps the tallest dog of any breed, and at any time, whose measurements have been recorded,’\(^3\) Vendetta having been 32½ inches in height.

The picture of alaunts reproduced below is from an illumination in the beautiful manuscript of Gaston de Foix’s work which was executed in the early years of the fifteenth century. The reproduction has been made from Baillie-Grohman, Pl. XVIII, opposite p. 64 (with which may be compared Pl. XIV, opposite p. 42, lower left hand; Pl. XXVIII, opposite p. 80, upper left hand and lower right hand; Pl. XLVIII, opposite p. 240, bottom).

De Noirmont\(^3\) says the alaunts always wore a muzzle, except in the chase.

The alaunt has not often figured in literature. One of the most notable occurrences of the word is in the Orlando Furioso (46. 138):

\begin{quote}
Come mastin sotto il feroce alano
Che fissi i denti ne la gola gli abbia,
Molto s’affanna e si dibatte in vano
Con occhi ardenti e con spumose labbia,
E non può uscire al predator di mano,
Che vince di vigor, non già di rabbia.
\end{quote}

National Library of France. These alaunts were sent against cavalry, bearing a brass pot of blazing pitch, ignited by means of alcohol, and trained to fierce biting of the enemy’s horses. They were protected by leather coats from the effects of the fire or from kicks and blows.

\(^3\) Leighton, p. 91, who knows of a mastiff (p. 29) somewhat over 33 inches, while De Noirmont (2. 300) refers to one as having been 37½ inches (.95 metre) in height; Leighton, by the way (p. 22), considers Chaucer’s alaunt to have been a mastiff. The New Eng. Dict., following Bailey, defines the word as ‘wolf-hound’; Scott (below, p. 138) as ‘wolf-greyhound’; Rose (below, p. 137) as ‘deer-hound’; none of these seems correct.

\(^3\) Leighton, p. 91.
Chance, a Great Dane, at the Age of Eight Months.
(From Leighton, *New Book of the Dog*, p. 85.)
which is thus translated by Rose:

As mastiff that below the deer-hound lies,
Fixed by the gullet fast, with holding bite,
Vainly bestirs himself and vainly tries,
With lips besmeared with foam and eyes alight,
And cannot from beneath the conqueror rise,
Who foils his foe by force, and not despite.

Vendetta, a Great Dane.
(From Leighton, New Book of the Dog, p. 88.)

The New English Dictionary furnishes no instance between Chaucer and Berners' Froissart (1525). In literature proper

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30 But in the Sowdone of Babylone (ca. 1400), we have (54-6):
To chase the Bore or the Veneson,
The Wolfe, the Bere, and the Bawson,
With Alauntes, Lymmeris, and Racches free.
the most conspicuous later use of the word is perhaps that by Scott in the *Talisman* (chap. 6), where he is describing the tent of Richard Cœur de Lion:

Skins of animals slain in the chase were stretched on the ground, or extended along the sides of the pavilion, and upon a heap of these silvan spoils lay three *alans*, as they were then called (wolf-greyhounds, that is), of the largest size, and as white as snow. Their faces, marked with many a scar from clutch and fang, showed their share in collecting the trophies upon which they reposed, and their eyes, fixed from time to time with an expressive stretch and yawn upon the bed of Richard, evinced how much they marvelled at and regretted the unwonted inactivity which they were compelled to share.

We have endeavored to show what were the alaunts mentioned by Chaucer. There remains the question, Whence did Chaucer derive his acquaintance with them?

Baillie-Grohman (p. 116) thinks that Chaucer may have seen some alaunts 'recently imported from Spain or France.' But we have no indication that there ever was an alaunt in England. Again he suggests that Chaucer 'may possibly have gone for his models to the court of King John of France (1350-1364), who possessed some of these huge Alans.' Certainly Chaucer can not have gone to Paris before the end of 1360, and we have no ground whatever for assuming that he was on the Continent in the years 1361-3, by the end of which year King John was on his way back to England. If the poet saw the court of France at all, the earliest date we can assign to the visit is 1368, when King John had been dead four years, and then it must have been in the train of Lionel.

It seems much more likely that the alaunts which he delineated in the *Knight's Tale* were those that he saw at the wedding-feast in Milan. He has undoubtedly heightened the descrip-

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27 See *Hist. Background*, p. 179.
29 They are thus described in the chronicles of Montferrat, Milan, and Mantua, respectively (*M. H. P.*, p. 1226; *R. l. S.* 16. 739; Alip., p. 1188):

'Sei cani alani, et sei gran striveri cum collari de velluto, et fibbie dorati, et lassi de seta.'

'Sex cani allani, et sei grandi striveri cum collari de velluto forniti de ricalcho dorato, et cum lassi de seta.'

E sei cani alani fur presentati,
Ancora sei stivieri [sic] in una schiera.

The other two chronicles refer to them merely as 'cani.' See p. 67.
Group of Alaunts.
tion, as he has done elsewhere. The alaunts can not have been 'as grete as any steer,' since we hear of no dog measuring more than 35, or at most 37½ inches in height at the shoulder; Chaucer's have collars of gold, instead of velvet collars and silken leashes, with clasps of gilded brass; 'twenty and mo' replace the six which Chaucer may have seen; 'leoun' and 'deer' are inexact equivalents. On the other hand, the best alaunts were white, and these dogs were regularly muzzled, just as Chaucer says. In fine, when we consider the rarity of alaunts in that period, outside of Spain and the French territory immediately contiguous, neither of which Chaucer ever visited; that Lionel did not bring them back to England, and there is no indication that an alaunt was ever seen in England; that, so far as we know, Chaucer's only opportunity of seeing alaunts would have been either at Paris or at Milan, both of which

It is possible that the collars, leashes, and buckles appertained merely to the 'striveri'; but in a somewhat similar case, in the first course, the two kinds of furniture are mentioned separately (velvet collars and silken leashes: gilded brazen chains, leather collars, silken leashes).

So in the 'ful ofte tyme' of Prolo. 52 (cf. Hist. Background, pp. 209 ff.); 'no Cristen man so ofte of his degree' (Prolo. 55); 'many a noble armee' (Prolo. 60); freckles (fraknes) for pockmarks (Hist. Background, pp. 167, 170); 'an egle tame, as eny lilie whyt' (K. T. 1320; cf. Hist. Background, p. 171; in Guy of Warwick 823 and Libeaus Descouns 773, a gerfalcon is called white as a swan); 'an hundred lorde's' (K. T. 1321; cf. Hist. Background, p. 172, note 1); 'dukes, erles, kinges' (K. T. 1324; cf. Hist. Background, p. 173, note 1); 'ful many a tame leoun and lepart' (K. T. 1328; cf. Hist. Background, p. 174, note 1).

Thus in King Alisaunder, composed before 1330 (Wells, p. 100), the author says of two greyhounds (5286),

Hy weren mychel als lyouns;
so in the Avoynyge of King Arthur (1350-1400) we are told of a wild boar (49),

He is heyer thenne a horse.

In King Alisaunder (5284) there appear

In a cheyne of golde twee greihoundes;
but 'golde' may here mean gilded brass, as in the gift at the first course at the wedding-feast (see above, p. 66).

See above, p. 133.
See above, p. 136.
Hôtel St. Paul.
Perhaps also in the park at Pavia; cf. Hist. Background, p. 186, note.
were visited in the journey of Lionel and his train; and that three of the outstanding characters\textsuperscript{47} of the finest alaunts were included by Chaucer in his description—their bigness, their whiteness, and the fierceness which required that they should be kept muzzled; it seems most reasonable to suppose that he was present when the six alaunts were delivered over to Lionel, perhaps for his use in the chase, or perhaps to be employed in war.

\textsuperscript{47} Such as Chaucer could hardly have gleaned from books, seeing that we have no right to assume that he was acquainted with Spanish, that Gaston de Foix's treatise was not even begun till 1387, and that \textit{The Master of Game} was not composed until after Chaucer's death. There remains the possibility that he might have learned of the alaunts from Froissart, who must have seen them on the journey, and again on his visit to Gaston de Foix at Orthez in 1388; but there is a directness in Chaucer's description which seems to point to personal observation.
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PREFACE.

This work is the result of studies begun at the University of Michigan in 1913 under Professor E. C. Case, and continued at Yale University during 1915 and 1916 under Professor Charles Schuchert; in 1916 it was submitted to the Faculty of the Graduate School of Yale University as a dissertation in candidacy for the degree of Doctor of Philosophy. Free access to both the Michigan and Yale collections has given the writer the opportunity of examining a large number of Paleozoic corals. In addition to the Yale material, there have been received from Doctor R. G. Carruthers of Edinburgh specimens of Hexaphyllia, Heterophyllia, and Holocystis; from Doctor Gerhard Holm of Stockholm, specimens of Calostylis; from Doctor F. X. Schaffer of the Royal Natural History Museum in Vienna, a number of Hexacoralla from the Alpine Trias; from Doctor R. S. Bassler, specimens of Calostylis and Paleacis from the United States National Museum collections; from Professor Case, the type specimens of Leptopora typa and Conopoterium effusum; from Professor R. R. Rowley of Louisiana, Missouri, specimens of Leptopora and Conopoterium. For all of these loans the writer's thanks are due.

The writer is indebted to Professor Alexander Petrunkevitch of the Zoological Department of Yale University for assistance in making the photographs which accompany this paper; and to Doctor T. W. Vaughan of the United States Geological Survey, Professors W. R. Coe and A. E. Verrill of Yale, and Professor T. C. Brown of Bryn Mawr for discussing with him the problem of coral phylogeny. To Professor Case, who first suggested the corals to him as a fruitful field for study, and to Professor Schuchert, whose constant guidance and kindly criticism have been of great assistance in the preparation of the paper, the writer hereby acknowledges his indebtedness.

While the question of the relationship of the Paleozoic and later corals cannot perhaps be definitely settled until a sequence of coral faunas is established representing Permian and Lower Triassic times, still geological occurrence is a factor that cannot be lightly set aside in forming an opinion on the subject. Dur-
ing the summer of 1915 the writer was employed in making thin sections of Paleozoic corals in the Yale collection. Genera were chosen which had resemblances to Hexacoralla, with the hope of finding some which showed a septal arrangement like that of modern corals. As the work progressed, it became increasingly noticeable that there was a great uniformity in the general method of addition of the septa; that the application of Faurot's rule of quadriseptate arrangement could be quite generally made; that, in short, the Tetracoralla are a natural group differing in a definite structural phenomenon from all Mesozoic and later forms in which the ontogeny of the skeleton is known.

Attention was then turned to those Paleozoic forms which have been classed recently with the Hexacoralla. While the writer does not pretend to have settled the question of the origin of the Hexacoralla, it is hoped that the evidence here presented will be conclusive in showing that there are no known Paleozoic Hexacoralla, and that the data furnished by this study of Paleozoic forms favor the theory of direct descent of modern hexacorals from tetracorals.
**TERMINOLOGY.**

*Apical pore.* A pore at the proximal end of a corallite which has been produced by budding. It communicates with the cavity of the parent corallite.

*Basal disk.* The soft floor or basal part of the polyp, in the folds of which all the radial skeletal structures are formed.

*Basal plate.* The first secretion of calcium carbonate in the form of an exceedingly thin plate. It can only occasionally be seen in adult coralla.

*Calyx.* The depression at the distal end of a corallite or solitary corallum.

*Columella.* A central longitudinal rod in the calyx or a knob on the calicular floor. See *Essential columella* and *Parietal columella.*

*Corallite.* A single individual of a compound corallum.

*Corallum.* An entire coral skeleton which may be solitary, secreted by a single polyp, or compound and secreted by a colony of polyps.

*Costae.* Ridges on the outside of the theca. They are opposite to the septa and are covered by the epitheca when the latter occurs. See *Rugæ.*

*Dissepiments.* Horizontal or sloping calcareous plates connecting adjacent septa.

*Epitheca.* A thin external calcareous deposit secreted by the overlapping edge (the "edge zone") of the basal disk in a single corallum. See *Peritheca.*

*Essential columella.* A columella which develops independently of other calicular structures or rarely as a specialization of tabulae. See *Tabellae.*

*Eutheca.* A wall formed by the introduction of new centers of calcification between the outer ends of the septa. According to Vaughan, there is no systematic importance in the distinction between eutheca and pseudotheca. It is doubtful whether these terms will ever become useful in Paleontology, as the centers of calcification are rarely to be seen in fossil forms. Even the distinction between theca and epitheca is obscure in many cases in Paleozoic corals.

*Major septa.* The cycle of longer septa which reach nearly or quite to the center of the calyx.
Mesenteries. The radial vertical lamellæ of the soft polyp, composed of mesoglea and endoderm. Upon their sides the muscles are attached.

Minor septa. The cycle of shorter septa which never extend far into the calyx. They appear late in the development of the corallum.

Mural pores. Regularly spaced pores in the thin-walled Tabulata. They are typically developed in the Favositidae.

Pali. Rods or knobs formed by the lobation of the inner ends of septa.

Parietal columella. A columella which results from a specialization of some of the radial calicular structures such as septa or pali.

Peritheca. A calcareous deposit covering the base and sides of a compound corallum. It is homologous with the epitheca of a single corallum.

Pores. See Mural pores and Apical pores.

Primary septa. The first group of septa to appear—usually two or four in Tetracoralla; six or twelve in Hexacoralla. See Major septa and Minor septa.

Protocorallite. The corallite secreted by the protopolyp.

Protopolyp. The parent of a colony of polyps forming a compound corallum.

Pseudotheca. A wall formed by the thickening and coalescing of the outer portions of septa. See Eutheca.

Quadriseptal arrangement. A pinnate grouping of septa, alternately long and short. Typically, as in the adult form of Cyathaxonia cornu, there are four in a bundle, but often there are only three or two.

Rugæ (pseudocostæ). Ridges on the epitheca. They alternate in position with the costæ and septa.

Septa. Vertical radial partitions of the calyx secreted in folds of the basal disk. See Major, Minor, Primary, and Secondary septa.

Tabelle. Small arched plates forming a part of the columella in certain genera like Lonsdaleia. They slope upward and inward toward the central axis.

Tabulae. Horizontal plates extending across the whole cavity of a single corallum or corallite.

Theca. The outer wall of a corallite or single corallum, exclusive of the separate outer layer, the epitheca, q. v. It may be formed in various ways. See Eutheca and Pseudotheca.
SUMMARY.

On pages 159 to 160 two theories for the origin of the Hexacoralla are outlined. The first postulates a common ancestry with the Tetracoralla and a lack of the skeleton-forming habit in the Paleozoic Hexacoralla; the second, a direct descent from Paleozoic Tetracoralla to Mesozoic, Cenozoic, and Recent Hexacoralla. The data which form the basis of this paper rather strongly favor the second theory, although no single fact has been found to actually conflict with either. The method by which this general deduction was made may be summarized as follows:

1. There are no known Hexacoralla in the Paleozoic. It is believed that this fact strongly favors the second theory, for otherwise it is necessary to add to the first theory the conception that the stock which finally developed into the Hexacoralla continued throughout the Paleozoic as exclusively soft-bodied forms; and that the post-Paleozoic corals went through a comparable series of changes which produced the same modifications in the soft basal disk as those which were taking place in the skeleton-secreting basal disk of the Tetracoralla. It thus would be necessary to consider that a widespread tendency to an invagination of the basal disk developed in the soft-bodied Paleozoic Hexacoralla, since a columnella occurs so commonly in the Triassic forms.

2. The case of Turbinolia, a genus of living Hexacoralla, whose early life history so closely parallels that of Tetracoralla, suggests a very close relationship between the Tubinolidae and Tetracoralla.

3. The Cyathophyllidae and Zaphrentidae approached Mesozoic time as strong stocks capable of important structural variation.

4. A marked tendency among Carboniferous forms is the widespread development of columnellas. Even the conservative genus Zaphrentis was subject to this change. The columnella is a far more prominent feature of the Hexacoralla than it is of the Tetracoralla. A correlative tendency is toward an increase in the number of septa and a consequent approach to radial symmetry.

5. Some change in structure or function in the coral polyp is indicated by this development in the late Paleozoic.
IMPORTANCE OF THE QUESTION OF PRIMARY SEPTA.

The ontogeny of the Tetracoralla has been the subject of a great deal of investigation and debate. It is a difficult subject because the group is extinct and any reasoning which involves the soft parts of the polyps must be done by analogy with living corals, while the part which is preserved as a fossil represents merely a substructure, external and not readily modified by vital changes in the function of the soft parts and yet at the same time extremely impressionable by varying or accidental external forces.

Because of the importance of the primary septa in the discussion of the phylogeny of the Tetracoralla the various papers on this subject have been repeatedly summarized and only a short account of them will be given here. Other summaries may be found in Duerden (1902) and Faurot (1909).

THEORIES OF PREVIOUS WRITERS.

Milne-Edwards and Haime (1851) regarded the Tetracoralla as having four primary septa to which the other (secondary) septa were added.

Ludwig (1861-66) insisted on the importance of the pinnate arrangement of septa in four groups but considered this condition to have been derived from an earlier grouping by six, and also that there were six primary elements, only four of which were involved in the formation of succeeding septa.

Kunth (1869) also clearly described the pinnate manner of addition of the secondary septa.

Pourtalès (1871) announced the discovery of an early stage of growth with only six septa. The specimens used were of Lophophyllum proliferum and conclusions were reached similar to those of Ludwig already stated.

Quelch (1886) and Ogilvie (1897) paid much attention to the microstructure, finding evidence of a close relationship between Tetracoralla and Hexacoralla.

Neumayr (1889 A and B) presented a strong argument for the view that Hexacoralla are directly descended from the Paleozoic
forms, calling attention to the geological occurrence, and to certain peculiarities of coral evolution—tendencies which are now referred to as parallel development.

Von Koch (1896) argued that the Tetracoralla arose from a stock whose individuals had six primary elements.

Van Beneden (1897) believed the fourfold structure of Tetracoralla indicated their close relationship to the Scyphomedusae.

Up to 1902 the idea of a primitive six-rayed condition in Tetracoralla had not received much support from paleontologists, but in 1902 Duerden, using new methods of careful sectioning, found a stage in *Lophophyllum proliferum* with only six septa. He concluded that this was the earliest skeletal stage. (See Fig. 1.)

![Fig. 1. The development of *Lophophyllum proliferum*. This and the following diagrams represent transverse sections taken in a continuous series from near the tip of the corallum to the calyx. The cardinal septum in each case is above; the counter septum below. × 1/2. (After Duerden.)](image)

Gordon (1906), working with decalcified siliceous specimens, announced the discovery of a stage with four septa in *Streptelasma profundum*. This precipitated an argument which developed new interest in the problems of morphology and ontogeny in both living and fossil forms of Anthozoa.

Carruthers (1906) finally settled the matter by finding in *Zaphrentis phillipsi* stages with “one,” four and six septa (see Fig. 2). It was found by a comparative study of a number of sections that the stage with “one” septum was quickly succeeded by a stage in which two new septa appeared as a bilateral pair. As the single “primary septum” is broken by a central gap later
in the development, it is evident that it really represents two septal elements and so the stage at which the first bilateral pair appears is called the four-septal stage. The first bilateral pair is quickly followed by a second one which appears on the opposite side of the calyx, bringing the number of septa up to six. A pause in the development occurs at this time, and after this the septa are added in a pinnate manner, their inner ends joining the septa of the first and second bilateral pairs. Whether or not this pause indicates an important stage in the phylogeny of the Tetracoralla is not clear, as such phenomena may be explained in various ways, but it occurs at a decided break in the ontogeny of the individual and so must be considered as probably representing a former adult stage.

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Fig. 2. The development of a Carboniferous Zaphrentid. ×½. (After Carruthers.)

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Fig. 3. The development of Cyathaxonia (1, 2, 3, 4) and of Turbinolia (1, 2, 3, 5, 6). The first twelve septa appear in the same order and with the same arrangement. ×½. (After Faurot.)
Faurot (1909), using Duerden's method of grinding down the coral tip and sketching each change in the arrangement of the parts, obtained a very complete history of the septal sequence in *Cyathaxonia cornu*. This led to an elaboration of Kunth's law of pinnate arrangement. A short summary paper by the same author (1914) gives his conclusion that in the case of the hexacoral *Turbinolia*, and the tetracoral *Cyathaxonia*, there is the same order of appearance and arrangement of the first twelve septa. (See Fig. 3.)

From the work of Lacaze-Duthiers, Von Koch, and others, it has been known for a long time that among modern corals some develop six primary septa, in others twelve septa appear all at once. In *Turbinolia* it is reported, however, that there is a stage with a "single septum" of two septal elements, which is succeeded by stages with four and six septa. Either the time of the beginning of calcification is a stage easily retarded or accelerated, or the modern Hexacoralla must be considered as a polyphyletic group.

**Conclusions.**

Although the ontogeny of corals, as far as septal sequence is concerned, is now known for a considerable number of both living and fossil genera, and is found to be quite uniform within a group, the phylogenetic relations of the Tetracoralla and Hexacoralla still are not wholly cleared up. Modern work on the phylogeny of recent Anthozoa shows that the arrangement of the mesenteries indicates most closely the various events in the history of the phylum and therefore the most promising results are apparently to be gained from a study of the arrangement of septa in the two sub-classes. This method, as can be seen from the above résumé, has been applied by nearly all the recent workers. It carries the assumption that the soft parts of the polyp of the extinct Tetracoralla, of which nothing is known except by analogy with modern forms, were essentially the same as those of living Hexacoralla. This assumption is considered to be justifiable by those who have studied both groups.

The results obtained by this method are divergent and those relating to the results attained through ontogeny should be tested in the light of chronogeny (geological appearance), and of the
geographical distribution of the coral stocks, a principle also insisted upon by Neumayr (1889). The work of Duerden and Brown seems to indicate that the origin of Hexacoralla is not a direct one from Tetracoralla, while the work of Faurot, Carruthers, and the author has brought out a similarity in the early ontogenetic history in the two groups that is perhaps more easily explained by a theory of direct descent. This question will be discussed on later pages (161-195).
THE TWO THEORIES OF THE ORIGIN OF HEXACORALLA.

As has been shown, there are two theories accounting for the origin of the Hexacoralla, one of which depends for its proof upon comparative anatomy of living corals, the other upon the study of the geological sequence and relationships of fossil forms.

THEORY OF COMMON ANCESTRY.

The first theory states that the Hexacoralla arose early in the Paleozoic from a stem which also gave rise to the Tetracoralla and Tabulata, but that the Hexacoralla did not commonly secrete a skeleton until the Mesozoic. A large amount of the history of the Hexacoralla would accordingly be lost, and as the phylum was already a very old one when the lime-secreting habit became firmly established in the Triassic, the early ontogenetic stages reflected in the skeleton of Mesozoic forms would be of doubtful phylogenetic value. The only test of the theory is an exhaustive study of the analogy of morphological characters—a method difficult to apply to an extinct group in which there is no direct contact of the vital organs with the skeleton, though much can be learned from the characters of living corals.

Brown (1915:542) has stated this theory as follows:

"1. All Anthozoa, Paleozoic, Mesozoic, and Modern, are derived from one common stem in which the zooids were bilaterally symmetrical and probably had eight mesenteries.

"2. One branch from this common stem, arising early in the Ordovician, leads up to the modern Alcyonaria (Octocoralla). * * *

"3. Another branch from this common stem, likewise arising early in the Ordovician, embraces the typical tetracoral corals of the Paleozoic—the Rugosa. * * *

"4. Another branch from the common stem gave rise to the Mesozoic and later zoantharians—Actinians, Scleractinians, Zoanthids and Cerianthids."

This explanation carries an assumption which is very difficult to accept. The advocates of this theory assume that throughout the Paleozoic there developed side by side a group of skeleton-
secreting Tetracoralla and a soft-bodied group which later gave rise to the Hexacoralla. Moreover, they assume that the evolution in the soft-bodied forms so closely paralleled that of the Tetracoralla that when the former finally adopted the skeleton-forming habit they had developed the same specializations of the basal disk. It is difficult to suppose, for instance, that the soft-bodied hexacorals of the late Paleozoic acquired a basal invagination as the Tetracoralla did, and this is necessary, under the theory of common ancestry, to account for the widespread occurrence of the columella in the Mesozoic.

**Theory of Direct Descent.**

The second theory is that the Hexacoralla descended from the Tetracoralla in late Paleozoic or, what is more probable, in early Mesozoic time. A comparative study of early ontogenetic stages should be valuable, but the chief test of this theory is whether or not a sufficiently close relationship can be established between the Hexacoralla of the Middle Trias and the late Paleozoic corals. The greatest difficulty in applying this method is a lack of data. The record of corals in the Permian is, as a rule, meagre, though in India there seem to be many of them, and a few are known from the Australian “Carbopermian”; but there is as yet no knowledge of any corals from the Lower Triassic.

The first consideration in comparing these two theories is, whether or not there are any Paleozoic forms which can confidently be referred to Hexacoralla. If such forms occur, then the second theory must be modified or abandoned.

Two Paleozoic genera, *Palaeacis* and *Calostylis*, have been repeatedly, though always with some opposition, designated as Hexacoralla. There are, however, very good reasons for saying that neither of the genera has any such close relationship with modern corals, as will be seen by the following analysis of these perplexing forms.
The Relationship of the Tetracoralla to the Hexacoralla. 161

TESTS OF THE THEORY OF DIRECT DESCENT FROM TETRACORALLA.

GEOLOGICAL OCCURRENCE.

So-called Paleozoic Hexacoralla.
Palaeacis and its Relation to the Tabulata.

A description of the genera Palaeacis, Microcyathus, and Ptychochartocytathus, and a list of species are given on pages 165-168.

Before its microstructure became known, Palaeacis, which then included the above genera, was supposed to be one of the Porifera or sponges. Its external appearance, the occurrence of small pores in the outer wall, larger pores in the cups, and a system of contorted canals, all rather favor this opinion, but there are other and more important structural conditions that cannot be explained as due to a relationship to Porifera.

Lack of Spicules.—First, although looked for again and again, no spicules have been definitely seen by any one. This is all the more important as the organisms occur preserved in a variety of ways, although numerous sections have never been possible on account of the scarcity of material.

Regularity in Budding and Constancy of Shape.—A much more decisive fact and one that removes the genus definitely from the Porifera is that there is a definite law of budding in Palaeacis, the same law applying sometimes to more than one species (see Pl. I, Figs. 1 and 2). This regularity in budding controls the shape of the individuals so thoroughly that it would be hard to find among corals a more constant shape than that of the type species, P. cuneiformis. There is no such control of individual shape in the Porifera. In no phylum is a greater variety of shapes in the same group possible than in the Porifera and in no phylum is external shape of less systematic importance (cf. Zittel-Eastman 1913: 47). The cuneate base which occurs in P. cuneiformis, P. obtusa, P. compressa, and P. cavernosa is a feature seen in some species of Hexacoralla which are not closely attached to their foundation. The hexacoral Endopachys maclurei of the Eocene of Alabama has a cuneate base quite similar to that of P. obtusa. Such a regular external form as this is again not a character which is to be expected in Porifera.

Trans. Conn. Acad., Vol. XXI 11 1917
Calcaceous Structure.—A very suggestive coral-like feature is the structure of the calcium carbonate as seen in thin sections of unaltered calcareous specimens. Diverging fibers, arranged in a manner comparable to that in recent corals, show that this material formed the original skeleton of Palaeacis. *P. cuneiformis*, the genotype, does not reveal any definite structure, as it is invariably replaced by silica, but lamellae can be distinguished on the surface, giving the aspect of diverging grooves and ridges. Between the ridges there are pores which open into canals leading into the main cavity. The inner ends of these canals have often been wrongly called mural pores and the genus has been placed on that account with the Tabulata or even removed to the perforate Hexacoralla.

*P. obtusa* occurs with the original structure of the calcium carbonate preserved and with the interstices filled by secondary silica and iron pyrite. Thin sections show the radial lamellae (Pl. I, Fig. 3). *Microcyathus depressus*, a closely related form, shows the same fibrous structure of the calcium carbonate and the inner pores communicating with the contorted canals (Pl. I, Fig. 4).

Comparison with Tabulata.—The one criterion which has proved satisfactory in distinguishing between Hexacoralla and Tetracoralla is the manner of addition of the secondary septa. This criterion, however, cannot be applied to forms like *Palaeacis*, since they have no definite septa. If the lamellae really represent septa, which is very improbable, their arrangement is obscured by the interlacing of the canals. Enough is known of the calcareous specimens to show that there are no structural characters which prevent classing these genera with Anthozoa. On the other hand, there are good reasons, stated below, for including them under the sub-class Tabulata in close relationship with *Pleurodictyum*, *Leptopora*, and *Vaughania*. All these genera are characterized by large individuals with thick walls which are traversed by canals very irregular in location and direction. There are no mural pores such as those of *Favosites*, although apical pores and canal openings give a similar appearance. The manner of budding is by pairs, with one individual slightly in advance of the other. The buds are added laterally in such a way that there may be formed a thin encrusting or globular colony.
Palæacis, Microcyathus, and Ptychochartocyathus belong in this group, having the same kind of thick walls and interlacing canals with pores opening on the inner cavity. The same laws of budding apply to them, except that in the case of P. cunei-formis the addition of buds is vertical instead of radial.

It is here proposed to place these closely related genera, Palæacis, Microcyathus, and Ptychochartocyathus, in one family, Leptoporidæ. This name was used in 1892 by Miller for a family which contained the one genus Leptopora and which was placed doubtfully with the Tabulata. As the family was not defined, a definition may be formulated which will include the other closely related genera, as follows:

Phylum Coelenterata.
Sub-phylum Cnidaria.
Class Anthozoa.
?Sub-class Tabulata (of uncertain relationship).
Family Leptoporidæ Miller.

Leptoporidæ: Specialized Tabulata with large corallites. Tabulae much modified or wanting. No true septa or true mural pores. Walls thick; traversed by canals. Inner wall grooved, ridged, or occupied by irregularly spaced pores which are the openings of the canals.

Genus Leptopora Winchell.

Original Description of Leptopora.—"Corallum occurring in thin discoidal masses; cells very shallow, crowded, polygonal, separated by a common cell wall, which is vertically striated; interior of cells filled with a finely vesicular tissue; cups polygonal, concave, elevated in the center, and displaying numerous radial lamellæ."

Original Description of Cleistopora.—"Corallum small, discoid, usually attached by its entire base to foreign bodies. Corallites short, prismatic, without tabulae, and having the inferior portion of the visceral chamber completely filled up with loosely reticu-
late calcareous tissue. Septa represented by striae only. Walls thick, traversed by minute irregular canals or pores.”

By comparing the above original descriptions it may be seen that there is no essential character to distinguish between them. A comparison of the original figures of *Michelinia? geometrica* Edwards and Haime, which is the genotype of *Cleistopora*, with the type specimen of *Leptopora* leaves no doubt that the genera are identical.

**List of Species.**

*Leptopora typa* Winchell. Genotype.


*Locality and horizon:* Burlington, Iowa. Mississippian (Kin-derhook).

*Leptopora winchelli* White.


*Locality and horizon:* Near forks of Logan River, Bear River Range, North Utah. Mississippian.

*Leptopora placenta* (White).


*Locality and horizon:* Sedalia, Missouri. Mississippian (Chouteau).

*Leptopora expansa* (White).


*Locality and horizon:* Sedalia, Missouri. Mississippian (Chouteau).

*Leptopora gorbyi* Miller.


*Locality and horizon:* Near Sedalia, Missouri. Mississippian (Chouteau).

*Leptopora procera* Rowley.


*Locality and horizon:* Annada, Missouri. Mississippian (Chouteau).

*Leptopora ramosa* Rowley.


*Locality and horizon:* East of Curryville, Missouri, associated with *L. placenta*. Mississippian (Chouteau).
The Relationship of the Tetracoralla to the Hexacoralla. 165

Genus Palæacis Milne-Edwards.

1869 Palæacis Kunth. Ibid., Vol. XXI: 185.

Original Description of Palæacis.—The original description by Milne-Edwards was taken from unpublished manuscripts of Haime which were to have been included in the Histoire Naturelle des Coralliaires. On account of the death of Haime, that work was published by Milne-Edwards alone. The description in translation is as follows:

Polypary free but composite, rounded and very compressed at its base; calices disposed, one at the summit, and the others in pairs upon the lateral margins. Coenenchyma finely vesicular.

List of Species.

Locality and horizon: Spergen Hill, Indiana. Mississippian (Spergen).
Palaecis obtusa (Meek and Worthen).


*Palaecis umbonata* Seebach. Ibid., Vol. XVIII, 1866: 309.

Locality and horizon: Nauvoo, Illinois. Mississippian (Kokuk).

*Palaecis compressa* (Meek and Worthen).


Locality and horizon: Nauvoo, Illinois. Mississippian (Kokuk).

*Palaecis cavernosa* Miller.


Locality and horizon: Jackson County, Indiana. Mississippian (Waverly).

*Palaecis carinata* Girty.


Locality and horizon: Arkansas. Mississippian (Fayetteville shales).

Genus *Microcyathus* Hinde.


Hinde suggested that a new genus be based upon *Hydnopora? cyclostoma* Phillips. It is here proposed to extend the genus to several other forms. Specimens of the genotype have not been accessible, but it is believed to be definitely related to the species listed below. The genus may be defined as follows:

Leptoporidæ, sometimes attached but often without a trace of attachment scars. Shape roughly spheroidal. Walls very thick; composed of contorted lamellæ pierced by ramifying canals. Pores, communicating with the canals, lining the steep walls of the inner cavity. Calices with broad, almost flat, floors. Number of corallites seldom more than three.

This genus differs from *Palaecis* in the microstructure, the external shape, and the cup-shaped or almost cylindrical instead of conical cavities.
The Relationship of the Tetracoralla to the Hexacoralla. 167

List of Species.

Microcyathus cyclostoma (Phillips). Genotype.


Locality and horizon: Western Europe. Lower Carboniferous.

Microcyathus enormis (Meek and Worthen).


Locality and horizon: Rockford, Indiana; Clarksville, Missouri. Mississippian (Kinderhook).

Microcyathus? antiquus (McCoy).


Locality and horizon: Ireland. Lower Carboniferous.

Remarks: This species has been considered to be identical with M. cyclostoma, but Hinde examined specimens from the type locality and decided that they were distinct. He even suggested that they may be placed in a distinct genus.

Microcyathus depressus (Meek and Worthen).


Locality and horizon: Monroe County (Salt Lick Point), Illinois; Missouri. Mississippian (Fern Glen).

Microcyathus koninckii (Etheridge and Nicholson).


Locality and horizon: Western Europe. Lower Carboniferous.

Microcyathus bifidus (Weller).


Locality and horizon: Missouri and Illinois. Mississippian (Fern Glen).

Genus Ptychochartocyathus Ludwig.


The genus was not defined and the figures are not definitive, but apparently this group differs from Palaeacis in having well defined spines on the inside of the cup, no pores, and a basai
plate. There is but one species, *Ptychochartocyathus laxus* Ludwig, from the Upper Carboniferous (Culm) of Rothmaltersdorf, near Glatz, Germany.

**Original Description of the Type Species (translation).**—Corallum compound, hemispherical, with a concentrically striated basal plate [epitheca?]. Cups deep and broad, with thick walls without pores. Septa represented by twenty-four large spines reaching down to the bottom of the cup. Between these, secondary septa (*Kerbleisten*) represented by rows of fine spines not reaching to the base of the cup. Depth of cups 0.8 cm.; breadth 0.7 cm.; height of corallum 1 cm.

The figures are very suggestive of *Palaeacis* but until a comparison between European and American forms is made this genus may be retained.

**Genus Pleurodictyum** Goldfuss.


The early descriptions are not satisfactory, as the structure of the genus was not understood. The following description is given in Zittel-Eastman (1913: 114):

"Corallum depressed, discoidal, circular or elliptical in contour, lower surface covered with concentrically striated epitheca, and frequently a foreign vermiform body occupying the center
of the base. Corallites small, polygonal, contracted inferiorly so as to become funnel-shaped. Septa represented by faint marginal ridges, or obsolete. Walls pierced by irregularly distributed mural pores; tabulae sparse.

**List of Species.**

*Pleurodictyum problematicum* Goldfuss. Genotype.


*Localities and horizon:* Western Europe. Middle Devonian (Eifelian).

*Pleurodictyum stylopora* Eaton.


*Localities and horizon:* Western New York. Devonian (Hamilton).

*Pleurodictyum lonsdalei* Richter.


*Localities and horizon:* Near Saalfeld, Thuringen, Germany. Devonian.

*Pleurodictyum (?) selcanum* Giebel.


*Localities and horizon:* Magdesprung and Zorge, Germany. Lower Devonian (Hercynian).

*Pleurodictyum constantinopolitanum* Roemer.

N. Jahrb. f. Min., etc., 1863: 519, Pl. 5.

*Localities and horizon:* Near Constantinople, Turkey. Devonian.

*Pleurodictyum megastomum* McCoy.


*Localities and horizon:* Victoria, Australia. Silurian.

*Pleurodictyum lenticulare* (Hall).


*Pleurodictyum petrii* Maurer (?).


*Localities and horizon:* Near Giessen, Germany. Lower Devonian.

*Pleurodictyum americanum* Roemer.

Locality and horizon: Western New York. Devonian (Hamilton).
Remarks: This species is probably a synonym for *P. stylopora*.

*Pleurodictyum zorgense* Kayser.
Fauna d. ältesten Devon-Ablagerungen d. Harzes, 1878: 229, Pl. 33.
Locality and horizon: Harz Mountains, Germany. Lower Devonian.

*Pleurodictyum amazonicum* Katzer.
Locality and horizon: Rio Maecuru, Lower Amazon region, Brazil. Lower Devonian.

Genus *Vaughania* Garwood.

*Original Description.*—“Corallum discoid, upper surface convex, margin lobulate; size variable, specimens occur measuring up to 5 cm. in diameter. Thickness in center = 3 or 4 mm., becoming somewhat less towards the margin. Base concave, covered with a well-marked, wrinkled epitheca, wrinkles arranged in festoon-like concentric folds parallel to the margin. Corallum apparently free. Corallites very short, closely set, polygonal, as a rule irregularly hexagonal; on an average, ten corallites occur in a length of 4.5 cm. Calices shallow, rather over 1 mm. deep, walls less than 0.75 mm. thick; floors nearly smooth and flat, but curving upwards at the margins to meet the base of the walls.

“In well preserved specimens the surface of the walls presents a somewhat rugose appearance, resembling Nicholson’s figure of *Cleistopora geometrica*, but there are no definite ridges or striae representing septa.

“The corallum is traversed by a system of large perforations or tubes, arranged on a definite plan. This is found in all well-preserved specimens, though it is liable to slight variation in detail.

“Round the base of the wall of each calyx runs a polygonal or roughly circular perforation or ring-canal, which follows
The contour of the wall; this lies just inside the angle formed by the junction of the wall with the floor of the calyx, and slightly below the level of the floor. Thus the base of each wall is traversed by two such tubes bordering the margins of two contiguous corallites. From these ring-canals, branches are given off, which open by pores into the floor of the calices near the base of the walls. Other branches are given off in the opposite direction from the ring-canals and traverse the wall horizontally, connecting the ring-canals of two adjacent corallites. Other pores are occasionally seen, opening higher up on the walls of the calices; these are, however, more irregular in their distribution. The pores opening round the basal margin of the calices are fairly numerous, and are placed close together, the distance between them being generally not much greater than the diameter of the pores themselves.

"In microscopic sections the walls and floors of the corallites exhibit a finely crystalline fibrous structure, similar to that which characterizes many recent corals. The long axes of the fibres are arranged perpendicularly to the walls and floors of the calices. There is no trace of the trabecular structure figured by Nicholson in his descriptions of Cleistopora and Palæacis, while tabulæ are entirely wanting. This compact fibrous coenenchyma is perforated by the tubes described above; and, in the neighborhood of the tubes, the fibres are arranged in a radial manner perpendicularly to the walls of the tubes. Vertical sections cut at right-angles to a corallite-wall show two perforations below the base of the wall and on each side of it, representing transverse sections of the two ring-canals of contiguous corallites. From these, in many sections, tubes can be observed passing obliquely outwards and upwards, and penetrating the floors of the calices at the base of the walls, where they terminate at the surface to form the pores already described. In horizontal sections, prepared so as to expose the base of the walls a short distance below the floors of the calices, the system of ring-canals and their connecting tubes can be well seen, the canals being rendered conspicuous by their infilling of darker argillaceous material."

The author of the genus directs attention to resemblances to Leptopora (Cleistopora) geometrica, and to Palæacis, Pleurodictyum and Microcyathus. The following points of difference from Leptopora (Cleistopora) are cited: (1) The absence of the
trabecular structure which characterizes that genus; (2) the presence of compact fibrous coenenchyma, forming the whole of the corallum; (3) the presence of a definite system of ring-canals and branches; (4) the presence of a well-developed basal epitheca, which is unattached.

The differences from Pleurodictyum are given as: (1) The calices are low and vertical, not funnel shaped; (2) there is no trace of tabulæ or septal spines; (3) the corallum is unattached; (4) there is no commensal vermiform body; (5) ring-canals are present. Pleurodictyum resembles Vaughania, however, “in the presence of intramural pores and of a concentrically striated basal epitheca.”

The differences from Palæcis are: (1) A much greater number of calices; (2) the corallites not wedge-shaped, but arranged with their walls perpendicular to the basal plate; (3) the calices having (comparatively) narrow and polygonal walls rising from the basal plate, and not excavated as circular pits in the general mass of the corallum; (4) the absence of vertical striae in the calices: (5) the regular arrangement of the perforations to form ring-canals; (6) lack of attachment.

Palæcis has similar pores. Microcyathus, which contains species often referred to Palæcis, resembles Vaughania in the compact calcareous matter in its walls, the wrinkled basal epitheca (this however is not always present in Microcyathus) and the presence of pores. These latter are more irregular in the case of Microcyathus and cannot be as correctly defined as a definite tubular system. Microcyathus has more rounded calices and blunt spines which seem to represent septa.

Genus Conopoterium Winchell.


This genus is doubtfully referred to the Leptoporidæ, as it exhibits some characteristics of the Favositidæ and may represent a transitional form.

Original Description.—“Corallum compound, generally free, sometimes adherent, but without a distinct base of attachment. Cells somewhat crowded, rapidly enlarging, inseparable, with only occasional and rudimentary diaphragms, and no radial
The Relationship of the Tetracoralla to the Hexacoralla. 173

lamellae. Walls marked internally by vertical striae, and a few pores which communicate between the cells. Exterior, where exposed, covered by an epitheca, marked only by irregularly encircling striae. Cells increasing laterally and interstitially.

"This genus, perhaps, approaches nearest to *Sphenopoterium* [Palaecis] Meek and Worthen. It differs in the absence of the cuneate form of the base even in *Sphenopoterium*—the cell mouths in this genus being turned indifferently in all directions. The cells also are smaller and more numerous, and the fewer mural pores communicate from cell to cell, instead of terminating in the intercellular substance. But one species has thus far been obtained."

**Type Species.**

*Conopoterium effusum* Winchell.


*Locality and horizon:* Clarksville, Missouri. Mississippian (Lithographic limestone).

This genus differs from the Leptoporidæ in its thin walls with their true mural pores, but the manner of budding and the lack of tabulæ may warrant its inclusion in this family. If it should be retained, the species *Michelinia* (*Pleurodictyum*) *convexa*, as illustrated by Hall (Illust. Dev. Foss.: XV, XV A), might also be added.

The Genus *Calostylis* and its Position in the Classification.

Phylum Cœlenterata.

Sub-phylum Cnidaria.

Class Anthozoa.

Sub-class Tetracoralla.

Family Calostylidæ.

Genus *Calostylis* Lindström.


1889 Calostylis Neumayr. N. Jahrb. f. Min., etc., Pt. II: 44.
1908 Calostylis Gürich. Leitfossilien: 38.

Calostylis was proposed by Lindström for a peculiar coral in the Silurian of Gothland, Sweden. Lindström, Duncan, and Zittel believed it to belong with the Hexacorallia, while Roemer, Neumayr, and Frech regarded it as an extraordinary development of the Tetracoralla.


In Gürich's *Leitfossilien* the genus is described as follows (translation):

Horn-shaped corals of the length of a finger. Upper Silurian of Gothland. They have over one hundred closely spaced septa in apparently several, but really two, cycles of two lengths representing primaries and secondaries. The septa are perforated, a character which, with this one exception, occurs only in the Hexacoralla. The broad central space has a spongy pseudo-[parietal] columella. The exterior has a thin epitheca. This apparent analogy with the structure of the much later occurring Hexacoralla may be considered as a case of parallel development [Konvergenzerscheinung] within the wide realm of variation of the Tetracoralla.

The statement that this is the only Paleozoic "perforate coral" is no longer true, as most of the Tabulata are more or less replete with mural pores. Furthermore, Hinde (1889) described genera of the family Archæocyathidæ from the Lower Cambrian among which there are several "perforate" corals. *Archæocyathus* (restricted) has perforated septa; *Coscinocyathus* has perforated transverse plates; *Protopharetra* has porous walls; *Ethmophyllum* and *Spirocyathus* have canal structure in the walls.

**List of Species.**

*Calostylis denticulata* (Kjerulf). Genotype.
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Calostylis lindströmi Nicholson and Etheridge.

Locality and horizon: Penkill, near Girvan, Ayrshire, Scotland. Silurian.

Calostylis(?) andersoni Nicholson and Lydekker.
Man. Pal., Vol. I, 1889:307, Fig. 189.


Remarks.—No description by the above authors has been found. The figures in the Manual of Palaeontology, however, are adequate. Lindström believed that these forms belong with the genus Helminthidium.

Calostylis spongiosa Foerste.

Locality and horizon: Irvine, Kentucky. Silurian (Waco limestone).

Previous Position.—On account of its porous septa Calostylis was at first placed among the Hexacoralla. This was opposed by Neumayr, who made a strong argument based on the facts of geological occurrence of coral groups. He pointed out the absence of perforations in forms of Tetracoralla from Silurian until Triassic time, and as there is no other evidence of Paleozoic forms of this sub-class with perforated skeletons, he was led to believe that this peculiar specialization occurred in the Tetracoralla, perhaps in response to a cause like that which has forced so many of the corals since the Paleozoic to assume a similar character. Other points of less force were made by both sides in the controversy. Those who favored Lindström’s view pointed to the peculiar spongy columella, the manner of budding, and the lack of a well defined epitheca, while those favoring the other side directed attention to the external shape as being essentially that of the Tetracoralla, and held that the budding phenomena in this sub-class could lead to such a grouping as that in Calostylis.
Grouping of Septa in Early Stages.—None of these arguments was decisive and nothing definite was known of the grouping of the septa in the early stages of growth—the most important fact of all—until the matter was taken up by Frech (1890). A cross-section was figured (Fig. 4) by him showing an arrangement of the septa in quadrants. In the same paper a specimen of *C. denticulata* was figured which shows, on the exterior, diverging lines indicating conclusively a pinnate addition of the septa such as appears in a similar way on the exterior of coralla of the genus *Streptelasma*.

![Fig. 4. Calostylis denticulata. × 2. (After Frech.)](image)

A specimen of *C. denticulata* in the Yale collections shows this especially well (Pl. I, Fig. 5). It may also be seen, although not distinctly, in two specimens (Cat. No. 42,569) in the United States National Museum. Specimens of *C. lindströmi* from the Girvan district in Ayrshire, Scotland, do not show definite striae which can be traced far enough to prove such a structure. It has not been seen among a number of specimens of *C. spongiosa* from the type locality, but these are much more irregular in their habit of growth than *C. denticulata* and the external markings are obscured by a more complete epithea.

A specimen of *C. denticulata* from the type locality was rubbed down at the tip with emery powder and as soon as structure could be seen upon the surface when covered by a film of water, it was polished and photographed (Pl. I, Fig. 6). The original from which the figure was made is mounted upon a slide and is in the Yale collections. It shows undisputable bilateral symmetry and a very plain grouping into four quadrants corresponding with the arrangements of Frech’s drawing (Fig. 4, above),
but most decisive of all, it shows the pinnate or quadriseptate manner of septal addition which was described by Faurot (1909). This is a structure which has never been described in any of the Hexacoralla but which, so far as present knowledge goes, is universal among Tetracoralla. It is the one unerring diagnostic character of the Zoantharia Rugosa (≡ Tetracoralla) as defined by Milne-Edwards and Haime.

Value of Perforations in Classification.—The occurrence of a perforate structure in any of the coral lines was demonstrated by Neumayr to have little classificatory value. A loose usage of the terms “Perforata” and “perforate corals” has unconsciously associated such forms as Favosites of the Tabulata, Calostylis, and the genera of Hexacoralla Perforata. The family Poritidae as defined by Milne-Edwards and Haime (1851) contained such diverse forms as Pleurodictyum and Protarea, as well as the more usual forms of perforate Hexacoralla. Neumayr protested against such a high valuation of porosity in classification, and called attention to the great differences among the forms which had been thus brought together on the basis of an artificial distinction. The term “Perforata” was finally restricted to the Hexacoralla. “The Hexacoralla form a connected series from the most extreme perforate Alveopora and Porites to the compact Astraea; the fundamental character which connects them all is the six-rayed arrangement of the septa. * * Calostylis is the only known member of a distinct group of the Tetracoralla. This group had a relation to the main line which was similar to the relation found to-day between the Perforata and Aporosa of the Hexacoralla.” (Neumayr 1889 B: 282.)

Neumayr’s conclusion has been well supported by further facts, especially the cases demonstrating the principles of parallel development and convergence among the Anthozoa which are forcing the opinion more and more that this group is extremely variable within narrow limits.

Conclusion.—It is believed that the foregoing considerations, especially the isolated geological occurrence, the order of appearance of the septa, and the limited value of porosity in the characterization of the larger groups, warrant a definite removal of the genus Calostylis from the Hexacoralla to a separate family, Calostylicae, of the Tetracoralla.
Other Peculiar Forms Sometimes Called Hexacoralla.

As recent work has emphasized the importance of a six-septal stage in the life history of a tetracoral it is not surprising to find a few species belonging to that sub-class which have only six septa in adult forms.

*Battersbyia gemmans* from the Devonian of England is exceptional in that some of its buds have six septa while others have a larger number. According to Neumayr (1889 B), the normal calices bear numerous buds on their borders. A part of these buds undergo a process of development like that of the parent; another part never develop more than five or six septa and within these smaller corallites several new ones form by "septal budding," a process which suggests that of fission. The products of the six-septal individuals, curiously, develop into ordinary large corallites with many septa, and like them produce buds at their borders. Specimens of this species have not been available, but judging from the illustration (Neumayr 1889 B: 276), there is nothing to suggest a close relationship with Hexacoralla.

*Hexaphyllia.*—The genus *Hexaphyllia* from the Lower Carboniferous of Europe has also been listed with Hexacoralla. The corallites are long, slender, and prismatic and have but few septa. There is some doubt as to the limits of this genus. Forms agreeing with the original description were once included in the genus *Heterophyllia*, a group which Neumayr (1889 B) considered to be dimorphic, producing corallites with many septa as well as others with only six in much the same way as in *Battersbyia*; but Duncan (1867: 644) in redefining the genus *Heterophyllia* concluded that the small individuals belong to another and distinct species.

A. Stuckenberg (1904) found specimens of the small six-septal forms in Russia at the village Ploskaja on the left bank of the river Pronja. For these he made a new genus *Hexaphyllia*, basing it upon the single species *H. prismatica* defined at the same time. As the genus now stands it contains also *H. m’coyi* (Duncan), *H. lyelli* (Duncan) and *H. mirabilis* (Duncan), species formerly included in the genus *Heterophyllia*.

*Heterophyllia.*—Specimens of *Heterophyllia* cf. *sedgwicki* Duncan from the Scottish Lower Limestone Group (Lower Carboniferous), Dunfermline, Scotland, give clear evidence that this genus follows the law of septal addition which is characteris-
tic of Tetracoralla. The calices are rarely preserved, for in ten specimens examined only one showed the distal septal ends but this one showed very clearly a division into quadrants. This specimen is shown on Pl. I, Fig. 7. The septal arrangement is indicated clearly in only one quadrant because of injuries to the polyp which affected all except that region of the calyx. A section made of one of the smaller specimens (Pl. I, Fig. 8) also shows a division into quadrants as well as the typical quadriseptal arrangement. It is noteworthy that the external ridges of this corallite do not alternate with the septa but are opposite the external septal ends.

Specimens of *Hexaphyllia m'coyi* (*Heterophyllia* Duncan) from the Scottish Lower Limestone Group at Gilnockie near Canonbie, Scotland, correspond closely to those described by Stuckenberg. Their mode of attachment is unknown as the fossils invariably occur as broken sections of the prismatic corallum. These sections vary from less than 1 mm. to 2 mm. in diameter. Neumayr (1889 B:277) suggested that these six-septal forms were related to the large individuals of *Heterophyllia* in a way similar to that in dimorphic individuals of *Battersbyia*.

Duncan, however (1867:645, 646), made separate species for the six-septal forms. He divided the genus *Heterophyllia* into two groups, one containing large forms with many septa, and one including small corallites with six septa. Eight species were described by him, three of them being forms with only six septa,—*H. m'coyi*, *H. lyelli*, and *H. mirabilis*. The genus was redefined by Duncan as follows:

"The corallum is simple, long, and slender. The gemmation takes place around the calicular margin, and is extracalicular. The septa are either irregular in number and arrangement, or else are six in number and regularly spaced. The costæ are well developed, and may be tubercular, spined, and flexuous. The wall is thick, there is no epitheca and the endotheca is dis-sepimental."

Another form so closely related to the three six-septal species of *Heterophyllia* that it must be placed in the same genus, was found by Stuckenberg (1904) in central Russia. Upon this species, *H. prismatica*, he based a new genus *Hexaphyllia* which, he indicated, should also contain the six-septal forms of *Hetero-
The generic characteristics of *Hexaphyllia* are, therefore, the prismatic to cylindrical corallites, having thick walls and regularly spaced septa that unite in the center. The chief difference from *Heterophyllia* is the regular arrangement of the septa. Completely formed tabulae occur in *Hexaphyllia pris-
matica*. Stuckenberg adds, "*Heterophyllia m'coyi* and *Hetero-
phyllia lyelli* evidently belong in this genus."

Forty specimens of *Hexaphyllia* cf. *m'coyi* from the Scottish Lower Limestone Group, Gilnockie, near Canonbie, Scotland, have been examined. They are all broken segments of corallites, prismatic or cylindrical in shape. Many of them, especially the larger ones, show the internal structure clearly when polished with emery powder. They correspond closely to the definition of the genus as given by Stuckenberg, but their reference to Hexacoralla is not so clear.

The adult corallites show six septa quite equally spaced but younger stages indicate that their mode of introduction is that of Tetracoralla. Such a stage is shown in Pl. I, Fig. 9. The bilateral symmetry is plainly indicated and the septal arrangement clearly suggests the occurrence of an earlier stage of growth with but four septa. However, even though the size of the specimens is very inconstant, there is no section in the many that were made that shows only four septa; on the other hand, in several adult specimens the six septa meet at equal angles at the center. Several of the smaller sections, however, showed the junction of the third and second pairs of septa consider-
ably farther from the center than in the specimen shown in Pl. I, Fig. 9. In these the arrangement is more symmetrical and it often is difficult to tell which arm of the Y formed by the septa of the second and third bilateral pairs is the younger. The number of septa is not large enough to show whether or not the addition of septa obeys the quadriseptal rule of Faurot. The arrangement of these six septa is that so characteristic of Tetracoralla. The arrangement of septa in these Scottish specimens of *Hexaphyllia* therefore points to a relationship to Tetracoralla.

Among the specimens of *Hexaphyllia* there were found several extremely small cylindrical individuals with thick walls and without septa which were at first thought to be young individuals of this genus, but as there were no gradations in structure between them and the six-septal forms, although the latter showed
considerable range in size, it is now held that they are generically distinct.

Summary of “Paleozoic Hexacoralla.”

From the above discussion it will be seen that a re-examination of the “Paleozoic Hexacoralla” has led to the conclusion that Calostylis, Heterophyllia, Hexaphyllia, and Battersbyia are genuine Tetracoralla and that the genus Paleacis is a tabulate of the family Leptoporidæ. Compound forms like Axinura and Pachyphyllum, at first sight closely resembling Hexacoralla, prove upon closer examination to have the bilateral symmetry and arrangement of Tetracoralla. A further discussion of these and similar genera is not attempted here, as their tetracoral nature may be easily ratified by examining the many illustrations of cross-sections which are available among the works of Rominger, Lambe, Nicholson, and A. Vaughan. The final conclusion from available data is that there are no known Paleozoic Hexacoralla.

First Fossil Corals.

Mackenzia of the Middle Cambrian.

Excepting some forms of uncertain relationship comprising the family Archaeocyathidæ, of wide distribution in the older Cambrian, nothing is known of stony corals earlier than the Middle Ordovician (Chazy). On the other hand, a soft-bodied form, Mackenzia, which may have some relation to the Anthozoa, has been described by Walcott (1911) from the Middle Cambrian of British Columbia. There are only two specimens known of this remarkable fossil and great doubt exists as to its relationship. It was at first placed among the Holothuroidea, while in Zittel-Eastman (1913) it was suggested that it may be an actinian closely related to Edwardsia. There is no calcareous matter now present in the specimens, but the suggestion was made by the author of the genus that “nearly all calcareous matter was removed by solution in the mud deposit prior to its consolidation and alteration into rock.” The presence of an Edwardsia-like organism in the Middle Cambrian is a matter of great significance because of the conclusion reached by Bourne, Brown, and others that the original stock from which the Anthozoa descended was one in which eight mesenteries occurred in the adult. This conclusion is supported by the fact
that an early ontogenetic stage with only eight mesenteries, commonly referred to as the Edwardsia stage, has been found in many lines of the Anthozoa.

First Coral Fauna.

Undoubted forms of the class Anthozoa representing the subclasses Alcyonaria, Tabulata, and Tetracoralla of the Zittel-Eastman classification have been found in the lower part of the Middle Ordovician. The first of these groups to appear are the Alcyonaria (Octocoralla) represented by Stylarca parva (= Tumularia parva Robinson 1916) and Fletcheria incerta. Tumularia parva is found near the base of the Middle Ordovician (Chazy) of the Lake Champlain-Montreal area and the Mingan Islands, and in the higher Stones River series of Virginia and Tennessee. Fletcheria incerta is also found in the Chazy of the above mentioned Canadian localities. Tetradius syringoporoides and Columnaria alveolata are other compound corals found in the Stones River series and represent respectively the Tabulata and the Tetracoralla. Columnaria alveolata continues into the later Ordovician formations, where it is associated with a number of other individual and colonial Tetracoralla.

From the above facts it is apparent that at the time of their first appearance as fossils in the Middle Ordovician the Anthozoa were already differentiated into three great groups, the subclasses Alcyonaria, Tabulata, and Tetracoralla. The origin of these widely differentiated stocks must surely have occurred much earlier in the Ordovician and most probably well back in the Cambrian.

Probable Ancestry of the Tetracoralla.

There are two species of cup or individual Tetracoralla of the Black River faunas so extremely different in their specialization that they also suggest a long unrecorded history for that subclass. These are Streptelasma profundum and Lindstræmia whiteacesi. The extremes of variation which they represent are almost as great as may be found between any two members of the sub-class and the problem of distinguishing the more primitive specialization must be attacked in other ways than by a comparison of adult characteristics.
A strict comparison of the life histories of these two species cannot be made as yet, since *Lindstrømia whiteavesi* is known only from a single specimen (Foerste 1906: 312). On the other hand, Brown (1909) made a detailed study of the development of *Streptelasma profundum* and found in siliceous specimens a peculiar early growth of the skeleton which is different from that of any other of the Tetracoralla yet investigated. He held that the genus in its earliest growth was devoid of septa. In a specimen from 1 to 2 mm. in length, he found no septa, the individual evidently having secreted a calycinal wall before any folds had developed in the basal disk. These young coralla were merely hollow cones with smooth inner walls. A little higher up in the calyx four septa appear at once, but these are not plates dividing the calyx into compartments, as is true of the Tetracoralla generally, but are low ridges in the cup. Succeeding ridges are added in bilateral pairs, until a stage with twelve septa is attained (Brown, 1909: 55, Fig. 2). After this stage of growth the septal ridges become more prominent, are raised into lamellar ridges, and finally, when eighteen septa are present, unite in the center of the calyx. In no other of the Tetracoralla has a skeletal growth been found without septa. This anomalous condition could have been brought about through fossilization. The specimens which Brown studied were all siliceous, *i. e.*, pseudomorphs, and the shortness of the septa may have been due to imperfect silicification. It was shown, however, that the septa still preserved delicate, thin edges, a fact which may lead to the idea that resorption of the skeleton took place during adult life. This process, nevertheless, does not appear to have been one operating upon the skeleton of Tetracoralla, for in all the other genera examined the early septa are complete.

_Hypothetical genus Protostreptelasma._—Brown established an hypothetical genus with the characters of an early stage in *Streptelasma profundum*. He named this genus *Protostreptelasma*, "a rugose coral having a hollow conical or horn-shaped calyx, straight or slightly curved, without septa or having only a few rudimentary ridges near the margin indicative of septa." Such a genus was considered to be the ancestor of the *Streptelasma* line.

The description of *Protostreptelasma* indicates a corallum of simpler structure than is known even in early youth among the
Zaphrentidæ, although an approximation to it is characteristic of certain of the Cyathaxonidæ, typically of *Petraia*, in which the septa, even in adult forms, do not reach the center of the deep calyx. From the study of early stages of a large number of Zaphrentidæ and Cyathophyllidæ, it has come to be recognized that the development of the young of Tetracoralla has either two, four, or six septa, all of which are complete and meet at the center. If an ancestral genus were deduced from the ontogeny of these forms it would be characterized by two or more complete septa instead of by a few rudimentary septal ridges. A strict analogy with the post-larval development in modern forms would add the further conception of an earlier disk-shaped corallum with a few complete septa. There is proof that such a condition actually existed among Tetracoralla as well as among Hexacoralla. The writer examined several specimens of *Pachyphyllum woodmani* collected by C. O. Dunbar from the Upper Devonian (Lime Creek) of Iowa, and found in them two small colonies which were cemented to the convex surface of fragments of large brachiopod shells. By slowly etching the inner surface of the shells with dilute hydrochloric acid the structure of the protocorallite in contact with the shell could be seen. As indicated in Plate I, Figure 10, the whole colony diverges from a minute circular attachment such as a hemispherical or disk-shaped sessile prototolyp might secrete and very similar to the first lime-secreting stages described by Duerden (1904) for *Siderastrea* and by Mavor (1915) for *Agaricia*.

The writer has found in his examination of abundant material of *Streptelasma* from various Ordovician localities that the earliest growth does not suggest a stage without septa. If such a one was present as that described for *S. profundum* and then was so speedily lost in later forms that it does not appear in the succeeding species, *S. corniculum* and *S. rusticum*, it may be seriously questioned whether it has phylogenetic significance. Figures 5 b and 5 c give conclusive evidence that *S. corniculum* has a life history like that of other Tetracoralla and not like that indicated by Brown for *S. profundum*.

As far as the present data go the hollow cone described by Brown as being the first stage in the skeleton of *S. profundum* is an exceptional and improbable condition among the Tetra-
The Relationship of the Tetracoralla to the Hexacoralla.

The Relationship of the Tetracoralla to the Hexacoralla.

Coralla. We can readily conceive such a primitive structure to have been present, but if in all the other forms of this subclass the youngest skeletons are found to be equipped with several complete septa, the contention may reasonably be made that such a condition should be found in the ancestral forms. The question would thus be whether in postulating an ancestral genus the more weight should be given to one of two very different forms representing the first known members of the line of tetracorals or to an ontogenetic formula which is found in all except one of the tetracorals so far investigated. In the opinion of the writer the finding of Lindstræmia whiteavesi side by side with Streptelasma profundum lessens the significance of geo-

![Diagram](image)

Fig. 5. The twelve-septal stage in Streptelasma profundum (a), after Brown; in S. corniculm, (b) diagram, (c) actual specimen. $\times \frac{2}{3}$.

logical occurrence in this case. It seems more reasonable to assume that the siliceous pseudomorphs have failed to preserve the entire structure of S. profundum accurately, and to trust the unvarying ontogenetic stages to reveal the history of the phylum.

Dominance and Decline of Various Coral Stocks.

The three sub-classes, Alcyonaria (Octocoralla), Tabulata, and Tetracoralla, which appeared in the Ordovician, became important members of the later Paleozoic faunas. The Alcyonaria continued with increasing importance throughout the Ordovician and Silurian and reached a maximum of development in the Silurian, although they survived the period of stress at the close of the Paleozoic and are represented in the living coral faunas. The Tabulata became very important in the faunas of the Silurian and Devonian due to the remarkable development of the Favositidae and Halysitidae. In the Mississippian they became an inconspicuous group and disappeared before the end of the Paleozoic. The Tetracoralla were the most conspicuous of Paleozoic corals, beginning in late Ordovician and
reaching a maximum in the Middle Silurian and Devonian. They continued as a vigorous line in the Mississippian, as the great coral reefs in England and western Europe testify, for the variation of forms in these localities is almost as great as that of the Devonian reefs in North America such as those of Alpena and Petoskey, Michigan, and the Falls of the Ohio at Louisville, Kentucky. In Permo-Carboniferous time a great restriction took place and the number of individuals as well as of genera was greatly reduced. With the end of the Permian record the history of the Tetracoralla closes, although some peculiar Triassic and Jurassic forms have been found to possess a few of their characteristics. No case has yet been recorded, however, of a Mesozoic or recent coral in which the tetracoral septal addition follows the laws of Kunth and Faurot.

Evolutionary Trends in Tetracoralla.

Lower Paleozoic.—The different families of the Tetracoralla were in the main established by the Middle Silurian. The Palæocyclidae and Cystiphyllidae seem to have been aberrant lines which transgressed the limits of favorable variation and so were destroyed. The Paleocyclidae occurred in the Silurian and Devonian; the Cystiphyllidae began in the Silurian and continued into the Carboniferous. The Cyathaxonidae were the most conservative of all the families of Paleozoic corals, following the same pattern from the Ordovician genus Petraia to Polycælia of the Permian (Zechstein), and also show an evidence of a lack of progressive variation, or, possibly even a retrogradation, in the Permian, in that Polycælia corresponds more closely to the original pattern of Petraia than do the Devonian members of the family. This is therefore obviously not a family from which a new stock should be expected to arise in the early Mesozoic. The two remaining families, the Zaphrentidae and the Cyathophyllidae, were the only ones which approached the end of the Paleozoic with the probability of survival. Both of these vigorous lines began in the Ordovician; gained a maximum of development in the Silurian which was sustained through the Middle Devonian, and both continued to produce important variations during the growth of the Lower Carboniferous coral reefs.
Permian.—The fate of these stocks in the cold waters resulting from the early Permian glaciation can only be conjectured. Their latest recorded occurrence is in the Permian of the great medial sea Tethys, where the individuals are common and apparently are confined chiefly to the Asiatic area. Polycaelia is the single well defined genus of the western and northern Permian sea of Zechstein time in western Europe and England. According to Waagen Lonsdaleia and Amplexus are found in the Permocarboniferous beds of the Salt Range of India and Zaphrentis, Clisiophyllum, (?) Dibunophyllum, and Pterophyllum have been reported from the Chitichun of the central Himalayas. The restricted number of genera in these localities can only in part be accounted for by the lack of adequate preservation, for reef-building forms occur abundantly. Other forms occur in Australia and New Zealand. This fact shows that in what appears to be their last stronghold, Tethys, the Tetracoralla were losing ground in point of numbers of genera, and that this decline was far more advanced in the cooler western and northern waters than in those of the eastern medial region. With regard to later occurrences, the evidence appears to be in favor of an earlier abundance of Triassic forms in western than in eastern Tethys, for it is the Alpine region in which the new forms first attain a vigorous reef-building character. The great gap in the record of coral evolution therefore comprises all late Permian and early Triassic time, and this absence of material does not permit a study of the evolutionary relations of these stocks, but it is certain that in the Middle Triassic the new forms, now Hexacorals, were conspicuous in the West, while it was not until the Jurassic that they appeared in large numbers in the East. This fact is suggestive rather than demonstrative of a western Tethyian origin for the Hexacoralla.
PLASTICITY OF TETRACORALLA IN THE LATE PALEozoic.

In the preceding discussion it has been shown that there are none of the so-called Paleozoic Hexacoralla that may not more definitely be placed in other sub-classes. It will next be pertinent to investigate the variability of late Paleozoic Tetracoralla, since the facts of geological occurrence clearly point to the theory of direct descent of the Hexacoralla out of the former as the more probable source. If the phylum has assumed, by the end of the Paleozoic, a pattern from which only slight variations occur, it may be possible to show that the variation is too limited to give rise to new forms. If the stock is no longer vigorous, how may it be expected to survive the increasingly desperate trials of vitality to which it is destined because of the cold waters of the Permian? 'On the other hand, if there is evidence of an unstable variation, producing giants and monstrosities, we may then look for the end of the phylum.

The Columnella as an Example of Variability.

There is one point of structure in which the late Paleozoic corals quite generally depart from the patterns established in earlier times. This is the presence of a columella, the most characteristic evolutional tendency of the last great coral assemblage, the Lower Carboniferous coral reefs of western Europe. Since the columella is nearly always present in some form in Carboniferous corals, it may be taken as the measure of their variability. In order to judge of this, we may, therefore, take under consideration the morphological and physiological significance of the columella.

Morphological Significance.

Milne-Edwards defined a columella simply as a central column. Four kinds were distinguished:

1. False columella (pseudo-columella). Caused by a twisting of the inner ends of the septa.
2. Septal columella (columella septalis). A fasciculate column composed of pali or similar structures.
4. Essential columella (columella propria). A separate unit of structure continuous from early stages to old age. It may be styliform, fasciculate, or lamelliform.

Classes 1, 2, and a part of class 3 fall into one group because the structure of the central column is always connected with structures outside of the central pit. Class 4 and the remainder of class 3 contain those forms which are independent central structures that do not involve any of the skeleton outside of the central pit. In order to express this difference Gregory (1900) has extended the term "parietal columella" to include classes 1, 2, and a part of class 3 of Milne-Edwards. Accepting this change the terms will be used in the following sense in the present paper:

1. Essential columella (true columella). One that develops independently of other calicular structures. It may be styliform, lamellar, or fascicular. It is usually compact or solid. (See Fig. 6c, page 193.)

2. Parietal columella (false columella, septal columella, pseudo-columella). One that is formed by a specialization of one or more septa or septal appendages. Such specializations are:
   a. Enlargement of the inner end of a single septum. (See Fig. 6b, page 193.)
   b. A central twisting of the inner septal ends.
   c. A development of large pali.
   d. The secondary deposit of calcium carbonate which usually obscures somewhat the origin in cases b and c.

A parietal columella may be compact or spongiose, fasciculate ("paliform"), styliform or lamellar.

Although forms with columellas appear as early as the Middle Ordovician (Black River) in Lindstramia whiteavesi, the time of their greatest development is the Lower Carboniferous (Mississippian), and corals with columellas have been an important element ever since. While they have thus become more numerous in the later development of corals, suggesting that such a structure is of some decided advantage, it is not obvious what particular importance it could have had in the physiology of the polyps. As a part of the stony calyx, the essential columella is a sub-structure secreted by the basal disk. If its
function should have been that of anchorage of the internal structures there might be no direct evidence of the attachment which evidently in modern corals is more a case of intimate intergrowth of the ectoderm and skeleton than an attachment in particular localities by ligaments or muscle endings.

Ogilvie (1897:295) noted that in forms with a prominent columella the lower part of the column and the circle of mesentery ends form a trench, thus affording a somewhat more sheltered situation for the gonads, which are attached to the lower part of the mesenteries, than a flat-floored cavity would offer. Whatever functions other than a central support or anchorage the columella may have had, it invariably indicates an invagination of the basal disk. It is a secretion in the ectoderm and as such could never have pierced the basal disk and come into direct contact with the internal organs. It has also been suggested by Ogilvie that the columella of recent corals may be looked upon as a specialization of the tabule of Paleozoic forms. Those early Paleozoic forms which had the least support from below, such as Streptelasma and the Cyathaxonidae, seem to have been especially liable to form columnellas. On the other hand, those forms with well developed tabulae, as in Zaphrentis, were less liable to form them. In the late Paleozoic, columella formation seems to be more or less correlated with the development of many septa as though it were representative of or the result of crowding.

Steps in Development.

Siderastrea.—Duerden in his study of Siderastrea radians (1904) has indicated the following steps in the development of an essential columella:

1. The columella is not seen until ten or twelve septa have appeared.

2. The first evidence of a central structure is the appearance of a few granules or knobs on the smooth central area of the basal disk. This may be accompanied by a thickening of the ends of one or two septa or by the development of several spinose growths from the septal ends.

3. Later on more knobs and spinose growths appear and a secondary infilling of calcareous matter makes the whole structure compact. This process of calcification of the loose structure
already formed often obscures the mode of formation, a difficulty that is met with in examining the adult forms of *S. radians*. Ogilvie thought the term "paliform pseudo-columella" to be applicable, and it was only from a detailed morphological study of all stages in the development that the columella of *S. radians* could be decided definitely to be an essential columella. In transverse section it is most often round, but sometimes is oval, with its long diameter in the direction of the directive mesenteries.

*Cyathaxonia.*—Among Paleozoic forms, *Cyathaxonia* has an essential columella, the developmental stages of which are indicated by Carruthers (1913) and may be briefly summarized as follows:

1. The columella is seen first at the time when eight or nine septa have appeared. The first septa meet at the center without any noticeable axial thickening.
2. The columella quickly attains prominence as a structure independent of the septa and tabulae.

The beginning of the columella cannot be independent of the septa in this case as the latter meet at the center, therefore there is a stage in the life history of *Cyathaxonia* at which the columella is parietal.

*Lophophyllum.*—*Lophophyllum* has a parietal columella of the lamellar type. It is never independent of the septum, from which it is an outgrowth, although it sometimes becomes styliform and projects as much as half an inch above the bottom of the calyx. This styliform aspect may be seen in *Lophophyllum tortuosum* (= *L. konincki* Milne-Edwards and Haime). When lamellar, its long axis lies in the direction of the cardinal and counter septa. It is usually a continuation of the counter septum, but sometimes the cardinal and other septa are involved. The youngest stage figured by Carruthers shows twenty-seven septa and has a well formed columella.

*Aulophyllum.*—Stanley Smith (1913) has described in detail the morphology and ontogeny of the genus *Aulophyllum*. This description clearly indicates the development of an essential columella. The process is as follows:

1. Six septa meet at the center.
2. A zaphrentoid stage in which the septa meet and coalesce at the center.
3. The septa separate from their medial junction and in the central area thus formed a columella develops as a vesicular mass of calcium carbonate. The septa are not wholly disconnected from the columella, but their reduced edges form a fringe of lamelle around it. The columnar vesicles are represented at first by simple arched tabulae. This stage enters at the time when about twenty septa have formed.

4. The septa become completely separated from the columella. This is an example of an essential columella which shows even in old age its origin in central tabulae and vesicles, without any obscuring of them by a later secondary infilling of calcium carbonate. Here too, however, there is a stage in which the columella may be called parietal, although many septal ends take part in its formation rather than one as in *Lophophyllum*, or a few as is probably the case in *Cyathaxonia*.

Both essential and parietal columellas are the results of an invagination of the basal disk. It is not even necessary to postulate an increase of secretion of calcium carbonate at the center to account for the rapid upbuilding of this part of the skeleton, since a central invagination in itself tremendously increases the area of lime-secreting tissue.

In the cases mentioned above the columella is evidently the result of such an invagination of the basal disk. This may have been in response to an upward pull at the center such as would result from an attachment of the lower ends of the mesenteries. In the case of the lamellar parietal columella of *Lophophyllum* the force acted most effectively at two opposite points of the polyp, causing an elongated invagination coinciding in direction with a septal element. This led to a continuous lamellar plate, the product of the fusion of a septum and the columella proper. The septum involved is the counter septum, a fact suggestive of the opinion held by various authors that the major septa lie in the direction of the directive mesenteries.

While the formation of all columellas is probably caused by some physiological necessity, the result of which we see in an invagination of the basal disk, there is yet a real distinction in a morphological sense between parietal and essential forms. The distinctive feature is the amount of influence the arrangement and form of the septa exert upon the columella of the
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adult. In the case of *Aulophyllum*, while there is a stage in which the septal ends are involved in the columella, they are always clearly distinct from it. Likewise in *Cyathaxonia* (Fig. 6), although the earliest stage of the columella must actually rest upon the central junction of the septa, these do not become involved but rather are excluded very quickly from the central area by the growing columella. In *Lophophyllum*, on the contrary, from the earliest stage until old age, the orientation, shape, and size of the columella are noticeably affected by a septum. In the case of parietal columellas which are actually crowded septal ends or appendages of septa, the distinction from the essential columella is so obvious that there is no danger of confusion.

Fig. 6. Longitudinal sections: *a*, Zaphrentis; *b*, Lophophyllum; *c*, Cyathaxonia. Heavy black shows areas of secretion of calcium carbonate. Nat. size. (After Carruthers.)

The genus *Aulophyllum* is a fine example of the versatility of columella variation. Not only do the size, shape, and compactness of the columellas vary in different specimens, but they are also extremely variable from time to time in the life of the same individual. This shows a sensitiveness to minor changes in the life processes which limits the value of columellar variation in classifying the larger groups of corals.

*Lonsdaleia.*—The parietal columella of *Lonsdaleia* has been figured and described by Stanley Smith (1916). It is a large central column such as is found in the Clisiophyllids generally. It appears rather late in the life of the individual, when there are about twenty major septa. At this time, either a group of tabellae is formed or the tabulae are drawn up into a peak at the center (see Fig. 7). As the development proceeds, the tabulae are broken up altogether at the center and a large number of
tabellæ form. Within the mound formed of tabellæ, there is a plate corresponding in direction to the cardinal and counter septa. It is derived from the counter septum. This axial plate is usually separated from the counter septum later in the life of the individual, but sometimes a connection is preserved until adult conditions are reached. Other lamellæ develop corresponding to the major septa, and still others arise independently. The cross-section of a columella of this sort gives the pattern of a cobweb, which is a characteristic of this and related genera. The presence of the continuation of the counter septum as an axial plate in the columella and its evident influence upon columellar development place this form in the group of parietal columellas. Accordingly, the ontogenetic history of a coral individual is summarized by Smith as follows:

"1a. The epithecal ring [basal plate] is laid down.
"1b. The earliest septa appear attached directly to the epitheca.
"2a. The counter septum grows into the middle of the corallites.
"2b. The dissepiments appear as a narrow peripheral zone, and may, even at this stage, separate the septa from the epitheca.
"3. During this third stage the septa are prolonged into the middle of the corallite and the tabulæ bending distally around the inner or 'axial' edges thus form the beginning of the central column. Truncation of the inner edges of these long septa takes place, and gives rise to the first septal lamellæ. * * *
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"4. At this stage the axial tabellæ are formed, and the central column assumes its true character. The extrathecal region is narrow, and many of the septa are still in contact with the epitheca."

Summary.

The appearance of a columella in nearly all the late Paleozoic genera of Tetracoralla shows that this line was still a variable one. The cause which effected this widespread change must have been some important alteration in function or structure in the center of the polyp. The different forms of both parietal and essential columellas indicate some such common underlying change. Finally, it is considered to be significant that this central structure, which is so common in Mesozoic and later genera of Hexacoralla, appeared so often in the tetracoral line just before the Permian-Triassic gap in the record which separates the two groups.
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The American Species of Marchantia

BY

ALEXANDER W. EVANS

NEW HAVEN, CONNECTICUT

1917
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I. INTRODUCTION

The genus *Marchantia* is almost world-wide in its distribution and includes some of the largest and most conspicuous of the Hepaticae. According to the current rules of nomenclature the genus was not definitely established until 1753, when Linnaeus published it in the first edition of his *Species Plantarum*, but the use of the name *Marchantia* dates from the year 1713. Linnaeus recognized seven species, only the first two of which, *M. polymorpha* and *M. chenopoda*, are now retained in the genus. The type species, *M. polymorpha*, he cites from Europe only, and gives Martinique as the habitat of *M. chenopoda*. At the present time *M. polymorpha* is known to be almost cosmopolitan, while the range of *M. chenopoda*, although apparently restricted to tropical America, is likewise very extended.

For a long time *M. polymorpha* was the only species recognized in Europe. In 1817, however, a second species, *M. paleacea*, was described by Bertolini\(^1\) from material collected in Italy. This species had been distinguished and figured by Micheli\(^2\) nearly a century earlier but had not been accepted by Linnaeus. It is now known to have a wide distribution in tropical and subtropical regions, its range extending far beyond the confines of Europe. Other European species which have been proposed from time to time, such as *M. macrocephala* Corda and *M. Sykora* Corda, have never received wide acceptance and undoubtedly represent mere forms of *M. polymorpha*.

The history of the genus in America, when the entire continent is considered, is very much involved. This is due partly to the full representation of the genus and partly to the confusion which has arisen in the interpretation of certain species. Before the publication of Gottsche, Lindenberg and Nees von Esenbeck's *Synopsis Hepaticarum*, in 1847, the following species of *Marchantia* had been recorded from North and South America: *M. papillata* Raddi (1823) from Brazil, *M. platycnemos* Schwaegr. (1827) from Brazil, *M. Szvartzi* Lehm. & Lindenh. (1832) from Jamaica, *M. squamosa* Raddi (1832) from Brazil,

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\(^2\) *Nova Plant. Gen.* 2. pl. 1, f. 4. Florence, 1729.
Alexander W. Evans,

*M. cartilaginea* Lehm. & Lindenb. (1832) from St. Vincent, *M. brasiliensis* Lehm. & Lindenb. (1832) from Brazil, *M. Berteroana* Lehm. & Lindenb. (1834) from Juan Fernandez, *M. domingensis* Lehm. & Lindenb. (1834) from Santo Domingo, *M. tholophora* Bisch. (1835) from Mexico, *M. inflata* Mont. & Nees (1838) from Martinique, *M. plicata* Nees & Mont. (1838) from Bolivia, *M. quinqueloba* Nees (1838) from the West Indies, *M. peruviana* (Nees & Mont.) Nees (1839, as Grimaldia peruviana) from Bolivia. In the Synopsis Hepaticarum these species are all recognized with the exception of *M. Swartzii*, which is made a synonym of *M. chenopoda*, and *M. platycnemos*, which is made a synonym of *M. papillata*. Two other species, *M. pusilla* Nees & Mont. from Chile and *M. lamellosa* Hampe & Gottsche from Venezuela, are described as new; a third species, *M. linearis* Lehm. & Lindenb. (1832), originally described from Nepal, is quoted from several of the Lesser Antilles; while both *M. polymorpha* and *M. chenopoda* are cited from numerous American localities. The Synopsis, therefore, recognizes sixteen species in all from North and South America.

During the period from 1847 to 1899 comparatively little was added to our knowledge of the genus in America. The following species, however, were described as new: *M. flabellata* Hampe (1847) from Venezuela, *M. Notarisii* Lehm. (1857) from Chile, *M. Dillenii* Lindb. (1883) from Jamaica, *M. subandina* Spruce (1885) from Peru, *M. Beschrelleii* Steph. (1888) from Brazil, and *M. oregonensis* Steph. (1891) from Oregon. Two of the most noteworthy papers on *Marchantia* appearing during this time were by Schiffner. In the first he brought out the fact that *M. brasiliensis* and *M. cartilaginea* were synonyms of *M. chenopoda*; in the second he showed that *M. tabularis* Nees, a South African species, was a synonym of the older *M. Berteroana*. Another reduction to synonymy was suggested by Howe, who showed that *M. oregonensis* was based on very uncertain characters and that it could not be well separated from *M. polymorpha*.

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3. No station is cited for this species in the original publication; the Synopsis, however, gives, "in India occidentali."


In 1899 Stephani\textsuperscript{7} published his monograph on *Marchantia* in the first volume of his *Species Hepaticarum*. He describes eighteen species in all from America, six of which are confined to North America and eight to South America. Of these eighteen species *M. Elliottii* of Dominica and *M. caracensis* of Venezuela and Mexico are described as new, while *M. cephaloscypha* Steph. (1883), originally described from New Zealand, is quoted from Chile and Patagonia. He accepts Schiffner's reduction of *M. cartilaginea* to synonymy but maintains both *M. brasiliensis* and *M. oregonensis* as valid. Under *M. tabularis* he cites *M. Berteroana* as a synonym (on the authority of Schiffner) but gives no American localities. Under *M. domingensis* he gives *M. inflexa* as a synonym and states further that the American stations for *M. linearis* (as given in the Synopsis) belong to *M. domingensis* instead. He includes *M. Dillenii* among the synonyms of *M. chenopoda* and considers that *M. peruviana* and *M. Notarisi* are very close to this species and may be merely forms of it. Two species recognized by the Synopsis, *M. quinquedolba* and *M. pusilla*, he gives up altogether, because they were based on fragmentary specimens, and he makes no mention whatever of *M. flabellata*.

If *M. Berteroana* is reinstated as an American species and if *M. flabellata* is added, Stephani's total of eighteen species would still be maintained, even if *M. brasiliensis* and *M. oregonensis* are considered synonyms. It will be seen that this total is scarcely different from the total of sixteen species given in the Synopsis *Hepaticarum*. The writer hopes to show, however, that these numbers are much too high and that further reductions to synonymy are necessary. In his opinion there are only nine species based on characters which seem trustworthy, and it is possible that two of these will not be considered distinct when they become more fully known. There remain five species which are doubtful, either because the published descriptions are incomplete or because the original material is immature or fragmentary. Two of these, as noted above, are discarded altogether by Stephani, and it is probable that the other three deserve the same fate. The doubtful species, however, will be alluded to briefly at the close of the paper.

No other liverwort has been so much discussed and described as *Marchantia polymorpha*. According to Lindberg\(^1\) it attracted the attention of naturalists at a very early date and was known to both Aristotle and Theophrastus. Within more recent times it has repeatedly been the subject of morphological researches and has served in numerous text books as a typical representative of the thallose Hepaticae. Over eighty years ago Mirbel\(^2\) published the first extensive account of its morphology. He brought out the essential features of the thallus and of its various tissues and gave a clear description of the receptacles and the gemmae. Of the later works dealing with the morphology of the species those by Leitgeb,\(^3\) Kny,\(^4\) Ikeno,\(^5\) and Durand\(^6\) may be particularly mentioned. The first two deal with the plant in a general way, very much as Mirbel's memoir did, although they include many original observations. The last two are much more specialized and deal with the cytology and development of the reproductive organs. Although *M. polymorpha* itself has been treated so exhaustively the other species of the genus have been but little studied by morphologists. In one of his earlier papers Schiffner\(^7\) published a series of interesting observations on the Javan *M. geminata* R. Bl. & N.; but aside from this,

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\(^1\) Hepat. Utveckling 15. Helsingfors, 1877.
\(^3\) Unters. über Leberm. 6: 114-123. pl. 9. Graz, 1881.
records of morphological importance are mostly in the form of scattered notes, and these are often to be found in taxonomic treatises.

In the present paper the morphology of *Marchantia* will be treated largely from the standpoint of the taxonomist. In other words the parts of the plant which yield the most distinct and constant specific characters will be primarily considered. These parts include the epidermis and the epidermal pores, the compact ventral tissue, the ventral scales, the rhizoids, the receptacles, and the cupules. The photosynthetic layer, the sexual organs, and the sporophyte, although yielding important generic characters, are less helpful when the individual species are considered. For the sake of completeness, however, a brief account of the sporophyte will be included.

The flat thallus of *Marchantia* is of the usual prostrate dorsi-ventral type and branches repeatedly by forking. It varies considerably in size and in thickness in certain species, so that measurements of its various dimensions have to be employed with caution. At the same time some of the species are distinctly larger than others. The growth of the thallus is normally unlimited until the sexual branches or receptacles (see Fig. 9, A, B) are produced. These represent the erect prolongations of prostrate branches and are limited in growth. The inflorescence is dioicous throughout the genus. Vegetative reproduction is carried on by means of discoid gemmae, which may be formed on either male or female individuals and which apparently do not interfere with the growth of the plant.

The thallus shows clearly the usual differentiation into an epidermis, a photosynthetic layer and a compact ventral tissue bearing scales and rhizoids. The photosynthetic tissue consists of a single layer of large air-chambers separated from one another by continuous plates of cells. Each air-chamber is connected with the outside by a single pore in the epidermal roof. From the floor of the chamber arise numerous short rows of green cells, subspherical in form and freely exposed to the air of the chamber. The rows, which are simple or branched, are mostly from two to five cells long and the uppermost cells, except in the vicinity of the pore, are usually attached to the epidermis. The air-chambers vary greatly in size, not only in different species but often in different parts of an individual thallus.
I. Epidermis and Epidermal Pores

The ordinary epidermal cells are fairly uniform throughout the genus and it is doubtful if they offer any very trustworthy differential characters. Their size often varies markedly on an individual thallus and may be directly affected by differences in external conditions. Although the cells are usually colorless or pale they sometimes produce chloroplasts in abundance. In the majority of cases they are arranged in a single layer, but in certain species at least, such as *M. chenopoda* (Fig. 19, E) and *M. paleacea* (Fig. 8, D), the epidermis may be two cells thick in parts of its extent. The walls may vary considerably in thickness, but they are rarely very firm and are destitute of distinct trigones.

Cells containing oil-bodies, cells containing slime, and minute surface papillae are sometimes found in the epidermis. The cells containing the oil-bodies are usually distinctly smaller than the neighboring cells and are easily distinguished by their granular contents, which nearly or quite fill the cell cavities. In *M. chenopoda* these cells are not infrequent and do not seem to be restricted to any definite part of the thallus; in *M. polymorpha* they occur near the margin and seem to be absent elsewhere; while in certain other species there are apparently no cells of this character in the epidermis.

Epidermal cells containing slime are, according to our present knowledge, restricted to *M. chenopoda*. The slime-cells are scattered about in the epidermis and always occur in regions where the epidermis is two cells thick, being situated in the inner layer (Fig. 19, L). They are much larger than the surrounding epidermal cells and strongly compress those of the outer layer. When a piece of the epidermis is examined from above the slime cells are seen to be covered over by these compressed cells. Apparently Voigt⁸ was the first to observe the slime-cells, although he failed to recognize their true character. The much larger slime-canals in *Conocephalum conicum* (L.) Dumort. were soon afterwards described by Goebel⁹ and Leitgeb¹⁰ pointed out that the slime-cells of *M. chenopoda* were of the same

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¹⁰ Unters. über Leerm. 6: 16. 1881.
American Species of Marchantia.

nature. He showed that they occurred not only under the epidermis, as he expressed it, but also in the compact ventral tissue and in the partitions between the air-chambers, and he emphasized the fact that they were especially abundant in the female receptacles. The distribution of the slime-cells in *Marchantia* was a little later discussed at length by Prescher.\(^ {11} \) He found no trace of them in *M. Berteroana, M. papillata, M. emarginata* R. Bl. & N., or *M. linearis*; he found them restricted to the compact tissue of certain definite regions in *M. polymorpha* and *M. paleacea*; and it was only in *M. chenopoda* (including *M. cartilaginea*) that he found them in the epidermis.

Surface papillae have been figured very accurately by Kny\(^ {12} \) in the case of *M. polymorpha*. They are minute appendages of the epidermis, which are cut off by walls and rounded or bluntly pointed at their free ends (Fig. 2, J, L, O, P). Sometimes a papilla is situated over a single cell and sometimes over the partition between two cells, showing in the latter case that an epidermal cell had divided after the papilla had been formed. Papillae of this type seem to be rare on vegetative branches and confined to certain species. So far they have been reported in two East Indian species, *M. emarginata* and *M. Treubii* Schiffn.,\(^ {13} \) but they seem to be absent from all the American species except *M. polymorpha*. In this last species, as shown by Schiffner,\(^ {14} \) the median portion of the thallus is always free from papillae, while the marginal regions sometimes show them clearly. The distribution is very different, however, in *M. Treubii*, where the papillae are most abundant in the median portion and gradually decrease toward the margins. Whether papillae of this character form a constant feature of any of the species where they have been found is perhaps doubtful. In one specimen of *M. emarginata*, for example, in the writer's collection (Schiffner, Iter Indicum 37), the plants seem to have developed no papillae, and they are frequently absent from the vegetative branches in *M. polymorpha*. When they occur on receptacles or cupules, as in this same species, they seem to be more constant.


\(^{12}\) Bot. Wandtafeln pl. 84, f. 2, 3. 1890.

\(^{13}\) See Schiffner, Fl. de Buitenzorg 4: 32, 35. Leiden, 1900.

\(^{14}\) Lotos 49: 93. 1901.
The complex epidermal pores of *Marchantia* are of much interest. They are of the dolioform or barrel-shaped type, that is, the opening of the pore is surrounded by two series of cells arranged in concentric rows, one series projecting more or less above the surface of the thallus, the other projecting into an air-chamber. Although pores of this type are found on the sexual branches of most of the Marchantiaceae, the only genera where they occur on the vegetative branches are *Marchantia*, *Preissia*, and *Bucegia*. Even in *Marchantia*, as shown by Kamerling,\(^{15}\) immature shoots sometimes produce pores of the simple type found in most of the other members of the group.

The first attempt to utilize the structural features of the pores for taxonomic purposes seems to have been made by Voigt.\(^{16}\) He studied eight species of the genus, and showed that the number of pores in a given area, the number of rows of cells surrounding a pore, and the number of cells in a row were fairly constant for each species. Stephani also has drawn specific characters from the pores, but certain of his distinctions, as will be shown below, are subject to variation and must be used with caution.

In the case of *M. polymorpha* the pores have been repeatedly figured, although the published illustrations are not all of the same degree of excellence. Among recent figures those by Voigt, Kny, and Müller\(^{17}\) bring out most of the essential points. According to Voigt, whose account of the pores is unusually full, the opening is surrounded by five circular rows of cells, three belonging to the upper and two to the lower series, but both Kny and Müller state that the upper series is normally composed of only two rows making four rows in all, a statement which agrees with the writer's observations (see Fig. 2, A, B). Under some conditions the number of rows may be reduced to three or even to two. In the upper series each row is composed (in most cases at least) of four cells (Fig. 2, A, B), and immediately surrounding the pore a circular membranous ridge is present, probably representing, as in the simple pores of *Targionia*,\(^{18}\) a collapsed series of cells. This ridge is shown by Voigt (f. 1),

\(^{15}\) Flora 84 (Erganzungsb.): 57. 1897.
but is not brought out in the figures of Kny and Müller. It is sometimes very narrow and absolutely colorless and can then be demonstrated only with difficulty. In the lower series each row is likewise composed in most cases of four cells, those bounding the inner opening being distinctly differentiated. Their usual appearance is clearly shown by Kny (pl. 84, f. 2), each cell being in the form of a narrow, curved, four-sided figure with a rounded median projection extending toward the center of the pore. All the cell-walls immediately bounding the pore are shown covered over with a granular deposit of some resinous substance, which hinders or prevents the entrance of water through the pore. Kny comments on the fact that the pores vary greatly in size and that the projections from the cells bounding the inner opening sometimes meet. In his opinion these projections probably make still more difficult the entrance of water through the pore. This view is upheld by Ruge,19 who finds the pores almost completely closed by the projections in a submerged form of *M. polymorpha*. In Fig. 2, D-I, some of the variations shown by the cells bounding the inner opening are brought out. In Fig. 2, E, the projections are only slightly developed, although the upper cell on the left approaches the condition portrayed by Kny; in Fig. 2, D, F, I, the projections are well developed but not sharply defined from the rest of the cell; in Fig. 2, G, H, the projections are both well developed and sharply defined. These last figures, drawn from a plant growing in a very wet locality, support the statements of Ruge and agree with the figures published by Müller. The cells drawn, however, seem to be nearly or quite destitute of the resinous deposit so conspicuously shown in the remaining figures and in Müller’s figures also.

Although the inner openings of the pores in *M. polymorpha* are subject to so much variation, Stephani insists that important specific characters in the genus *Marchantia* are yielded by the inner openings. He recognizes four types20 and states that they are not connected by transitional conditions. In the first type the four cells bounding the opening are narrow and not materially changed in shape by increased turgidity, the opening itself exhibiting a quadrate form. In the second type the four bounding

19 Flora 77: 294. f. 11. 1893.
cells bulge into the opening in the form of rounded projections, the opening itself showing an outline with four strongly concave sides and four sharp angles; by increasing the turgidity this opening can be almost completely closed. In the third type (which is essentially the same as the pores of *Preissia*) the four cells likewise bulge into the opening but the bulging portions are more sharply defined and the opening appears in the form of a four-sided figure with very concave sides but with rounded dilations at the angles; this opening, which Stephani describes as cruciate, can be completely closed by an increase of turgidity. In the fourth type the opening is very large and bounded by many cells (fifteen in Stephani's figure), each cell bulging into the opening in the form of a longer or shorter cylindrical projection, the opening itself thus acquiring a very irregular outline. To the first type Stephani assigns (among others) *M. polymorpha*, *M. plicata* and *M. domingensis*; to the second type, *M. disjuncta*; and to the third type, *M. cephaloscypha* and *M. paleacea*. The only representative of the fourth type is *M. macropora* Mitt. of New Zealand.

Schiffner, however, had already called attention to the danger of placing too much confidence in the peculiarities of the cells bounding the inner openings. According to his account these cells in most species of *Marchantia* bulge more or less into the opening, the form of which may vary accordingly, and his statements would support the view that there was no sharp distinction between the first and second types of Stephani. Even in *M. Berteroana*, which Stephani would assign to his third type, Schiffner finds only an insignificant modification of the usual condition. He adds that the number of bounding cells in this species, although usually four, may vary from three to six on an individual thallus, and that the walls of the cells commonly lack the resinous deposit found in *M. polymorpha*. Goebel is likewise inclined to recognize a single type of pore in *Marchantia* with respect to the inner opening, and he sees no essential difference between Stephani's fourth type and the others. He expresses no positive opinion on this last point, however, because he had no material of *M. macropora* at his disposal. He considers that the pores are plastic structures, subject to modifica-

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tion through external conditions, and he emphasizes the fact that the pores of xerophilous forms can often be more or less completely closed by an increased turgidity of the bounding cells.

It is clear from the observations of Schiffner and Goebel that the pores in Marchantia (excepting perhaps in M. macropora) conform to one general type and that the distinctions relied upon by Stephani are less constant than he supposed. This is especially well seen in M. polymorpha, where the inner opening shows all gradations from a quadrate to a cruciate form and thus exemplifies all three of the conditions upon which the first three of Stephani's types were based. M. polymorpha, however, is an exceedingly plastic species and it is doubtful if any of the other members of the genus exhibit the same wide range of variation in the inner opening. Schiffner's figures of M. geminata, for example, although illustrating conditions connecting the first and second of Stephani's types, show no approach to the third; while in M. paleacea, according to the information at hand, the inner opening is always cruciate and thus does not deviate from the third type. For purposes of taxonomy, therefore, the writer would still consider it expedient to recognize two types of pore among the American species, the distinctions between the types breaking down in the case of M. polymorpha. In the first type (which includes Stephani's first and second types) the inner opening is bounded by three to six cells, the usual number being four, and shows all gradations between a polygon, commonly four-sided, with slightly convex sides and one with strongly concave sides and sharp angles. In the second type (which is the same as Stephani's third type) the inner opening is distinctly cruciate with four rays dilated at the apex or, in the rare cases where the number of bounding cells is less or greater than four, with fewer or more rays. Stephani's fourth type, which does not occur in America so far as known, need not be further considered.

As an example of the first type of pore M. chenopoda may be selected. In this the opening, as pointed out by Voigt, is surrounded by about seven rows of cells, shown clearly in cross-section (Fig. 19, C-G), four of the rows usually belonging to the upper and three to the lower series. The walls bounding the opening are either smooth or with a resinous deposit. In the upper series (Fig. 19, A, B) the innermost row is usually composed of four narrow cells and the second row of the same num-
ber, but the third row commonly shows twice as many and the fourth row a much larger number. The ridge immediately around the opening is clearly marked. In the lower series (Fig. 19, H-K) the innermost row lies almost directly beneath the second row, so that only the first and third rows show clearly from below. The first and second rows are usually composed of four cells each, the walls bounding the pore being more or less strongly convex. The third row usually contains more cells than the first and sometimes twice as many, but it rarely contains as many as the fourth row of the upper series, where the cells are essentially like the ordinary epidermal cells. Of course the numbers just given are subject to variation, the number of cells bounding the outer and inner openings being often more than four.

As an example of the second type of pore *M. paleacea* may be selected, and the illustrations given in the present paper (Fig. 8, A-H) may be compared with the one published by Müller. The descriptions given by Voigt may likewise be consulted. The cells bounding the pore are usually in six rows, three belonging to each series, and the rows are commonly composed of four cells apiece. The cell-walls bounding the pore are smooth throughout. In the upper series the ridge around the opening is distinct and the cells are very narrow, standing in sharp contrast to the neighboring epidermal cells. In the lower series the cells bounding the inner opening are much broader than the others and project so strongly that they often touch in the center and almost occlude the cruciate opening. Sometimes one or more cells of the second row project also (Fig. 8, D), but the cells of both the second and third rows are usually narrow, resembling in this respect the cells in the upper series.

According to the account given by Kamerling, the size of the inner opening in a pore of the first type is not decreased to any great extent by an increase of the turgidity of the surrounding cells, while in a pore of the second type the decrease is very marked. In his opinion the cells surrounding the inner opening act independently of the cells in the other rings. As a definite example of a species with pores that can be closed he quotes *M. nitida* Lehm. & Lindenb., a species which is to be regarded as a synonym of *M. paleacea*.

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23 Rabenhorst's Kryptogamen-Flora 6: f. 188. 1907.
24 Flora 84 (Ergänzungsbl.) : 46. 1897.
The ventral tissue in *Marchantia* gradually thins out from the thickened median portion until it is frequently only two or three cells thick along the margins of the thallus. It consists primarily or even wholly of parenchyma and its chief function apparently is to act as a storage-tissue for water and organic food. In some parts of the thallus it is usually possible to demonstrate the presence of elongated pits in the cell-walls, and a purplish pigmentation of the walls is often apparent. Cells containing oil-bodies are usually conspicuous among the other parenchyma cells (Fig. 20, A) and seem to be present in all the species. In herbarium material, however, it is not always easy to demonstrate them. Cells containing mycorrhiza are likewise very frequent. In *M. chenopoda*, as noted by Leitgeb and Prescher, the ventral tissue and the partition walls between the air-chambers contain scattered slime-cells similar to those found in the epidermis. Slime-cells of this character occur also in the compact tissue of *M. paleacea*, *M. breviloba* sp. nov. and the East Indian *M. emarginata*, but have not yet been detected in other species except in connection with the reproductive organs. According to Cavers the slime-cells and slime-canals of *Conocephalum conicum* fail to develop when the plants are cultivated under water, and it is therefore possible that slime-cells may not always be present in the species of *Marchantia* just listed. In fact Prescher reported that they were absent from *M. emarginata*, and specimens of *M. paleacea* and of *M. chenopoda* might be cited where they are very infrequent or perhaps not present at all.

The only cells found in the ventral layer which are not parenchymatous in their nature are the more or less elongated sclerotic cells with yellow or brown walls, which occur in certain species. Cells of this character were first demonstrated by Goebel in the case of *Preissia quadrata* (Scop.) Nees, and the same author has called attention to their occurrence in the New Zealand *M. foliacea* Mitt. In this species, according to his account, the sclerotic cells are variable in length and are usually scattered singly among the parenchyma cells. Occasionally two

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27 Flora 96: 194. f. 143. 1906.
cells will occur end to end and sometimes even longer groups or strands are formed, perhaps corresponding with Stephani's "strands of sclerenchyma." The walls of the cells are thick and pigmented, showing that their functions are primarily mechanical, but Goebel finds that the cavities sometimes contain starch-grains. Sclerotic cells occur in several American species, such as *M. paleacea*, *M. chenopoda* (Fig. 20, A, B) and *M. dominensis*, and agree closely with Goebel's description. Whether they are always produced by the species where they have been detected is perhaps a question. Cavers calls attention to the fact that *Preissia quadrata*, when grown indoors in a moist atmosphere, fails to develop thick-walled cells, and in all probability the formation of the similar cells in *Marchantia* is influenced by environmental conditions. In any case, however, the presence of sclerotic cells is associated with certain definite species.

3. Ventral Scales

The ventral scales in *Marchantia* exhibit considerable diversity, not only when different species are compared but also when an individual species is considered. This is due to the fact that each species produces at least two distinct kinds of scales, only one of which bears appendages. In the other genera of the Marchantiaceae the scales with appendages are the only kind produced.

Taylor was apparently the first to observe that the scales in *M. polymorpha* were not all alike. He distinguished three different kinds, and these are described at length by Leitgeb, who designates them as median, laminar and marginal scales, respectively. The median scales are attached by a long line, which begins near the axis of the thallus, then extends almost longitudinally and finally curves gently outward, reaching perhaps half way to the margin. The scales are at first very narrow but become abruptly dilated in the outer part; here on each scale the characteristic appendage is attached, strongly contracted at its junction with the scale and then abruptly dilated into an orbicular expansion, rounded to apiculate at the apex (Fig. 1).

30 Unters. über Leberm. 6:114. 1881.
The laminar scales are more numerous than the median scales and form a series about midway between the median scales and the margin. They are attached by a much shorter line and broaden out at once into lunulate or ovate structures, rounded at the apex and destitute of appendages. The marginal scales are still more numerous and attached by even shorter lines, but they resemble the laminar scales in lacking appendages and in most other respects. They are situated near the margin and some of them extend beyond. The arrangement of the scales is shown clearly in a figure by Goebel,\textsuperscript{31} who brings out the fact that the laminar scales are arranged in an irregular row and that the marginal scales are still more irregular in their arrangement, although a linear series is approximated.

The account of the scales just given is somewhat at variance with the description and figures of Müller.\textsuperscript{32} According to this author the innermost scales are long and very narrow; they are attached almost longitudinally throughout their entire length and are destitute of appendages. These are said to be borne instead on the scales of the next outer row, which agree in all respects with the median scales as described by Leitgeb. The third type of scale recognized by Müller includes both the laminar and marginal scales of Leitgeb. An interpretation of the scales, closely agreeing with Müller's, has recently been published by Massalongo.\textsuperscript{33} The present writer, however, has been unable to demonstrate the narrow innermost scales without appendages. According to his observations the statements of Leitgeb are essentially correct.

The scales in \textit{M. polymorpha}, as well as in the other species, are delicate in texture and are sometimes more or less pigmented; in most cases, however, the pigmentation is of short duration and the scales become bleached and transparent. The cells tend to be wavy and irregular, especially toward the margin (Figs. 7, A; 20, C). The cell-walls are thin, although trigones may sometimes be demonstrated on the marginal scales. Scattered about among the other cells are cells containing oil-bodies (Fig. 20, D) and rhizoid initials, the latter giving rise to tuberculate rhizoids (Fig. 20, E). In the appendages rhizoid initials are absent, but cells containing oil-bodies can often be distinguished (Figs. 1, 3, etc.).

\textsuperscript{31} Organographie der Pflanzen \textit{f.} 158. Jena, 1898.
\textsuperscript{32} Rabenhorst's Kryptogamen-Flora \textit{6:17. f.} 12. 1905.
According to Leitgeb the scales in certain species, such as *M. domingensis* and *M. nitida*, are all of the median type while in *M. chenopoda* the laminar scales are less numerous than the median scales and the marginal scales are absent altogether. In Goebel’s figure of *M. chenopoda* a single laminar scale is shown among sixteen median scales and the implication is made that the number of laminar scales is very small. The writer has examined numerous specimens of *M. paleacea* (which includes *M. nitida*), of *M. chenopoda* and of other species and finds laminar scales always present (see Fig. 6, H-O). They differ from the laminar scales in *M. polymorpha*, however, in being situated much closer to the median scales. On account of their shorter lines of attachment they extend only a small part of the distance toward the median line. The laminar scales usually alternate with the median scales but occasionally there may be two laminar scales between two successive median scales. Under these circumstances one of the laminar scales is often reduced in size.

The species just noted will give some idea of the differences in arrangement which the ventral scales may show. These differences can often be utilized in separating species, but the best differential characters yielded by the scales are those drawn from the appendages. These are, with very rare exceptions, borne singly and, as has been shown, are confined to the median scales. Although the appendages vary, within wide limits in certain species, they nevertheless present striking and distinctive features. In comparing them the form, the character of the margin and apex, the size of the cells, and the presence or absence of cells containing oil-bodies should be taken into consideration. With respect to size the cells may be approximately the same throughout the entire extent of an appendage (see Fig. 16, F, G). It is much more usual, however, for the median cells to be much larger than the marginal cells and the gradation from one to the other may be either gradual (see Fig. 7) or very abrupt (see Fig. 5, A-D). The texture of the scales, aside from the appendages, is much the same throughout the genus. The scales and their appendages will be again considered in connection with the various species discussed below.

*L. c. f. 157.*
4. Rhizoids

The rhizoids in the genus *Marchantia*, as in practically all of the Marchantiales, are of two types, the smooth and the tuberculate. In the smooth type the walls are thin or uniformly thickened; in the tuberculate type numerous local thickenings of the wall extend into the lumen of the rhizoid in the form of cylindrical or bluntly conical projections. In some of the tuberculate rhizoids the projections are discrete and irregular in their distribution; in others they are more or less coalescent and show a spiral arrangement. Kamerling\(^{25}\) has shown that these spiral tuberculate rhizoids are abundant in *M. polymorpha* and Schiffner\(^{26}\) has examined this and other species of the genus with reference to these peculiar structures. He confirms Kamerling's statements about their occurrence in *M. polymorpha* and finds, so far as American species are concerned, that they are equally abundant and typical in *M. chenopoda*; that they still occur, although in less typical form, in *M. domingensis* and its allies; and they are wanting altogether in *M. paleacea*.

Most of the rhizoids in *Marchantia* run in parallel bundles under the scales and converge to form a single large median bundle. There are, however, numerous rhizoids in the thickened median portion which spread at right angles to the surface, and Schiffner has made a number of interesting observations on these. In forms of *M. polymorpha* where a definite dorsal band lacks air-chambers, the rhizoids in question are smooth; in forms where the air-chambers extend across the median region, the rhizoids are tuberculate. In *M. plicata* the spreading rhizoids are smooth; in *M. chenopoda*, smooth; in *M. Berteroana*, tuberculate; in *M. paleacea*, smooth or with scattered tubercles. These differences may sometimes be of help in distinguishing species.

5. Receptacles

The receptacles in *Marchantia* are strikingly different from the vegetative branches and attain a higher degree of complexity than in any other genus of the group. Two distinct portions may be distinguished, the erect stalk and the horizontal disc (or recep-

\(^{25}\) Flora 84 (Ergänzungsb.): 31. pl. 1, 2, f. 7. 1897.

Alexander W. Evans,

tacle proper), which bears the sexual organs. In some cases the disc shows clearly that it has but one plane of symmetry. In other cases it presents the appearance of being radial; but even here, as recently emphasized by Goebel,\textsuperscript{27} there is actually but a single plane of symmetry, a fact made clearly evident when the structure and development of the receptacle are considered. The stalk, likewise, looks superficially as if it were radial, but here again a single plane of symmetry is present, and the stalk maintains its dorsiventrality (or zygomorphy) in spite of its erect position.

It has already been noted that the receptacles represent prolongations of prostrate branches. These branches may be more or less elongated, but they are often very short, a receptacle being developed almost immediately after a dichotomy has taken place. A receptacle, as shown so clearly by Leitgeb,\textsuperscript{28} is a branch-system, the growing point of the original prostrate branch undergoing one or more divisions. A study of the stalk shows that the first division usually takes place very early in the development of the receptacle. If a cross-section is examined (Figs. 5, K; 8, 5; etc.) the dorsiventrality of the stalk becomes at once apparent, and the side which represents the ventral portion usually shows two deep longitudinal furrows, enclosed by scales and containing tuberculate rhizoids, the dorsal side being destitute of such furrows. In very rare cases a single furrow is present near the base of the stalk (Fig. 20, I). The presence of two furrows is evidence that the growing point has already divided once, even if the stalk itself remains undivided. Usually no further divisions take place until the disc begins to develop, but in some cases the stalk shows three or four rhizoid furrows, indicating that one or two secondary divisions have occurred. This is seen clearly in \textit{M. breviloba} and \textit{M. domingensis} (Figs. 9, I-K; 12, A, D). In the first the stalks of both male and female receptacles show four furrows apiece; in the second the stalk of the male receptacle which is figured shows three furrows, the stalk of the female receptacle showing four. The occurrence of more than two furrows has apparently been rarely observed in \textit{Marchantia} and allied

\textsuperscript{27} Organographie der Pflanzen, 2d ed. 686. 1915.

\textsuperscript{28} See Unters. über Leberm. 6: 20-37. 1881.
genera. Spruce\textsuperscript{39} mentions the occasional presence of three furrows in the stalk of the female receptacle in \textit{Marchantia}, without citing definite species; Leitgeb,\textsuperscript{40} in a single instance, found four furrows in the stalk of the female receptacle in \textit{Preissia quadrata}; Stephani\textsuperscript{41} states that the stalk of the male receptacle in the African \textit{M. Wilmsii} Steph. has four furrows but doubts the constancy of this condition; and Schiffner\textsuperscript{42} notes that the stalk of the female receptacle in \textit{Bucegia romanica} Radian sometimes shows four furrows. These seem to be the only references to more than two furrows in the literature, but in all probability a higher number than two would occasionally be found in most species of \textit{Marchantia} if enough stalks were examined. In \textit{M. breviloba} four furrows seem to be the rule in the female receptacle, although it would hardly be safe to state that four were always present.

In the case of \textit{M. polymorpha} it was noted long ago by Mirbel that the dorsal side of the stalk of the female receptacle showed a distinct strip of photosynthetic tissue with air-chambers, epidermal pores and short green filaments. This strip seems to be of constant occurrence throughout the genus. It commences close to the base of the stalk and extends nearly to the disc. In most cases the strip is continuous (Figs. 5, K; 8, J; 9, K; etc.) but sometimes, as in \textit{M. chenopoda}, it may be separated into two strips by a median groove (Fig. 20, G-I). In the stalk of the male receptacle photosynthetic tissue is usually absent, the dorsal portion being composed of compact parenchyma. In certain species, however, such as \textit{M. domingensis}, the photosynthetic tissue is about as well developed in the male (Fig. 12, A) as in the female receptacle. In \textit{M. breviloba} the lower part (Fig. 9, I) of the stalk develops photosynthetic tissue while the upper part (Fig. 9, J) lacks it completely.

In the disc of the male receptacle the dichotomous branching usually continues and a distinct division into rays becomes apparent. Although the number of rays is subject to variation, certain numbers seem to be normal or typical for certain species. In \textit{M. polymorpha}, for example, there are usually eight rays

\textsuperscript{40} Unters. über Leberm. 6: 31. 1881.
\textsuperscript{41} Hedwigia 31: 196. 1892.
present and in *M. chenopoda*, four, although deviations from these numbers are of frequent occurrence. Goebel\(^43\) considers that the number of rays developed is dependent on nutritive conditions. In an unnamed species from the Fiji Islands, related to *M. geminata*, he notes a reduction in the number of rays to two, showing that only one dichotomy has\(^*\) taken place, and he compares this extreme condition with the two-rayed female receptacles found in *Exormotheca* and *Aitchisoniella*.

The rays are in one plane and vary greatly in length. They are sometimes much shorter than the undivided portion of the receptacle, appearing in the form of rounded marginal scallops separated by shallow but acute sinuses. This condition is seen clearly in *M. polymorpha* and its allies. It is much more usual, however, for the rays to be longer than the undivided portion, the whole receptacle thereby acquiring a palmate appearance. This type of receptacle is found in such species as *M. chenopoda* and *M. domingensis* and is commonly associated with a smaller number of rays than the first type. In some cases at the tip of a ray a slight depression marking the position of a growing point can be discerned, even in an old receptacle, but often all traces of the growing points disappear. The stalk is not attached to the disc marginally but peltately, although often excentrically. The peltate attachment is due to intercalary growth taking place in the region where the dorsal surface of the stalk and the dorsal surface of the disc would naturally be continuous. In this way a thin plate of tissue is formed between the two external rays of the disc, which would theoretically be distinct to their junction with the stalk. The presence of this plate, similar in all essential respects to the tissue forming the sinuses, intensifies the radial appearance which the receptacles of certain species show.

In its structure the disc shows many of the features which are found in the vegetative thallus. It is distinctly dorsiventral and the differentiation into epidermis, photosynthetic tissue and compact ventral tissue is clearly marked. On the ventral surface of the rays scales with appendages and scales without appendages can be distinguished in two or more series, and the appendages are much like those of the ordinary scales except that they are smaller and sometimes less constricted at the base. Rhizoid

\(^{43}\) Organographie der Pflanzen, 2d ed. 699. f. 669 II. 1915.
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initials are present among the cells of the scales, the appendages alone being free from them.

The antheridia arise in acropetal succession, the oldest being formed near the center of the disc. In many species each ray develops two distinct rows of antheridia, but in certain species, such as *M. polymorpha*, the antheridia are more irregular in their arrangement and each ray shows more than two indistinct rows. The antheridia are borne singly in deep depressions with small circular openings. The depressions extend down into the compact ventral tissue, and are surrounded by the characteristic air-spaces with their branched rows of photosynthetic cells and dolioform epidermal pores.

The stalk of the female receptacle develops more slowly than that of the male receptacle and persists in an active condition until the sporophytes are mature. In the disc the division into rays takes place just as in the male receptacle and the number of rays present is subject to similar variations. The archegonia form groups and arise in acropetal succession, beginning when the disc is very young; but, on account of the strong intercalary growth in the median region of the dorsal portion, the archegonia are arched over and displaced until they seem to be situated on the ventral surface of the disc. In this way the oldest archegonia come to lie nearest the periphery of the disc and the youngest nearest the stalk. Each group of archegonia contains a variable number, arranged in two or three more or less definite radial rows, and is derived from one of the growing regions of the disc.

In the East Indian *M. geminata* and its allies the groups of archegonia are clearly situated underneath the rays of the receptacle. These rays, therefore, are obviously homologous with the rays of the male receptacles throughout the genus. This condition, however, is very exceptional. In most species of the genus, including all the American representatives, the groups of archegonia alternate with the rays of the receptacle and are situated in the sinuses between them. This is caused by the rapid intercalary growth of the regions between the growing points, the so-called "middle lobes"; the rays, accordingly, are formed by the middle lobes and are not homologous with the rays of the male receptacle but rather with the sinuses. These relationships are discussed at length by Leit-
Alexander W. Evans,

geb, who notes also the fact that the two external rays are to be compared with the "side lobes" in an ordinary dichotomy. In *M. polymorpha*, where nine rays are commonly present, seven would represent middle lobes and two, side lobes. Between the two side lobes there is of course no group of archegonia, so that there are eight groups for the entire receptacle, showing that three dichotomies have taken place.

The rays of the female receptacles vary in length, very much as in the case of the male receptacles. There is, however, no correspondence between the two. In *M. polymorpha*, for example, the rays of the female receptacle are long, and those of the male receptacle are short, while in *M. chenopoda* the conditions are reversed. The rays of the female receptacle differ also in form, being flat in some species and cylindrical in others. When they are flat they are often retuse or shortly bilobed at the apex, and Goebel points out that a deepening of the apical sinuses would lead to the condition found in *M. geminata*, where sinuses instead of rays are present between the groups of archegonia. In young receptacles the rays are strongly curved downward, but they gradually straighten out if fertilization has taken place and assume a horizontal position.

On account of the strong intercalary growth which displaces the archegonia to the lower surface of the disc, the portion of the receptacle which is morphologically ventral is less extensive than at first appears. The lower surface between the groups of archegonia is ventral in character and the same thing is of course true of the lower surface of the rays, especially when these represent the middle lobes of the branch-system. Even here, however, when the rays become cylindrical through intercalary dorsal growth, the ventral surface is much less extensive than the dorsal. In *M. geminata* the ventral surface of the rays is situated on both sides of the groups of archegonia. The ventral surface is characterized by the presence of tuberculate rhizoids and slender scales, the latter being sometimes branched and strikingly different from the ventral scales of the vegetative thallus. The dorsal portion (except where the archegonia are situated) develops a complex system of air-chambers of the usual type.

\[44\text{Unters. über Leberm. 6: 34. 1881.}\]
Each group of archegonia is enclosed by an involucre, which consists of a pair of membranous structures often toothed or laciniated on the margin (Figs. 2, M; 4, F, G; 8, K; etc.). Each archegonium is further protected by a campanulate pseudoperianth contracted at the mouth to a small opening. It begins its development soon after the archegonium is formed but does not reach full maturity unless fertilization has taken place. The pseudoperianth is very delicate and becomes irregularly torn when the stalk of the sporophyte elongates.

6. Sporophyte

The sporophyte, as in all the Marchantiaceae, shows the usual differentiation into foot, stalk and capsule. The foot is flattened and forms a low ridge enclosing the base of the stalk. The latter is at first very short, but it elongates sufficiently at maturity to push the capsule through the calyptra and beyond the mouth of the pseudoperianth. The capsule constitutes the principal part of the sporophyte. It is nearly spherical in form and is bounded on the outside by a wall composed of a single layer of cells. These cells throughout the genus have brownish ring-like thickenings in their walls, although the rings are often incomplete. The entire cavity of the capsule is filled with spores and elaters. The spores are much smaller than in most genera of the Marchantiaceae, especially in *M. polymorpha* and its allies. In some cases a distinct border is present where the spherical face meets the three plane faces, and under these circumstances low and irregular surface lamellae are usually developed. In other cases the spores are destitute of distinct markings and become completely rounded off after the tetrads break up. The elaters are long and slender and of the usual type, showing two distinct spiral bands. At maturity the wall of the capsule splits from the apex to about the middle into an indefinite number of lobes, some of which may become further subdivided. There are apparently no very definite lines of dehiscence, the edges of the splits being irregular and jagged from projecting cells which formerly interlocked. Except for the spores, which differ in size and in the peculiarities of their walls, the sporophyte yields very few differential characters.
7. Cupules

The characteristic gemmae of *Marchantia* have been repeatedly described. They consist of flat discoid structures, each bearing two opposite marginal growing points in shallow indentations. They are attached to the thallus by a short stalk, which joins the margin of the gemma midway between the growing points, the gemma in consequence being vertical in position. The gemmae occur in clusters on the upper surface of the thallus and are surrounded by a circular membranous outgrowth, forming a cup or cupule. Although the gemmae are very uniform throughout the genus, the cupules yield a few differences which sometimes assist in the determination of species. Two principal types occur: in the one, the margin of the cupule is simply dentate to ciliate, the teeth being sometimes scattered and sometimes close together; in the other type the margin bears a series of triangular pointed lobes, the edges of which are dentate to ciliate. As an example of the first type *M. domingensis* (Fig. 12, K) may be cited, while *M. polymorpha* (Fig. 2, N) shows the second type clearly.
III. DESCRIPTION OF SPECIES

Nees von Esenbeck\(^1\) divided the genus *Marchantia* into the two sections *Astromarchantia* and *Chlamidium*. The first included species in which the female peduncle was "central"; the second, which was first proposed by Corda as a genus, included species in which the female receptacle was "excentric." In the first section he placed *M. polymorpha*, in the second *M. paleacea*. These two sections are retained in the Synopsis Hepaticarum, except that the first is renamed *Stellatae*; they are likewise retained by Dumortier,\(^2\) who coined the name *Marchantiotypus* for the first section. Schiffner\(^3\) follows the example of the Synopsis, emphasizing the radial symmetry of the female receptacle in the *Stellatae*; while Stephani bases his two groups, "a" and "b," which he does not designate by formal names, upon differences in the symmetry of the female receptacle, the first group including species with "symmetrical" receptacles and the second, species with "unsymmetrical" receptacles. It is interesting to note that he includes *M. paleacea* in his first group, although his predecessors had placed it definitely in the section *Chlamidium*.

The fact has already been brought out that the female receptacles throughout the genus are always symmetrical with respect to one plane of symmetry but never with respect to more than one. Stephani’s distinction, therefore, falls to the ground, and the distinction in the position of the stalk, emphasized by Nees von Esenbeck, is not much more trustworthy. In certain species, where the two basal rays are sometimes distinctly shorter than the others and sometimes about as long, it breaks down altogether; in the first case the stalk would be "excentric," in the second "central." At the same time the sections *Astromarchantia* and *Chlamidium* represent natural groups of species and can still be maintained if different characters are used to distinguish them. In *Astromarchantia*, for example, there are no sclerotic cells in the thallus, and the rays of the female receptacle are terete, at least in the outer part; in *Chlamidium*, sclerotic cells

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\(^1\) Naturg. Europ. Leberm. 4: 60. 1838.
\(^3\) Engler & Prantl, Nat. Pflanzenfam 1\(^3\): 37. 1893.
are normally present in the thallus, and the rays of the female receptacle are flat or convex. In both these sections the involucres (and clusters of archegonia) alternate with the rays. A third group, typified by *M. geminata*, in which the involucres are situated beneath the rays, also seems worthy of sectional rank, but since this group is not represented in America (at any rate according to our present knowledge), it need not be further considered here.

In the preparation of this paper the writer has had the privilege of examining the large collection of *Marchantia* in the herbarium of the New York Botanical Garden (N. Y.), which includes the Mitten and Underwood herbaria. This has been supplemented by the specimens in the Cryptogamic Herbarium of Harvard University (H.), which includes the Taylor and Sullivant herbaria, and by the material in the United States National Herbarium (U. S.), the private herbarium of Miss C. C. Haynes (C. C. H.), and the herbaria at Yale University (Y.), the last including the Eaton herbarium and the writer’s private herbarium. Several specimens from the Montagne (M.) and Boissier (B.) herbaria, including a number of types, have likewise been available for study, through the courtesy of MM. Paul Hariot and G. Beauverd, respectively. The writer would extend his sincere thanks to all who have aided him in his work.

**Key to the species**

<table>
<thead>
<tr>
<th>Thallus destitute of sclerotic cells: stalk of male receptacle destitute of air-chambers, with two rhizoid-furrows; rays short and broad: stalk of female receptacle with a single band of air-chambers and two rhizoid-furrows; rays mostly nine or more, terete, at least in outer part; involucre with dentate or ciliate lobes: cupules with dentate lobes, bearing papillae on outside.</th>
<th>Section I. <strong>Astromanarchantia</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidermal pores usually surrounded by four rows of cells, never distinctly cruciate: marginal scales present; appendages of median scales irregularly crenulate or denticulate. Rays of female receptacle bearing papillae; basal sinus scarcely or not at all wider than the others.</td>
<td></td>
</tr>
<tr>
<td>Rays of female receptacle destitute of papillae; basal sinus usually distinctly wider than the others.</td>
<td></td>
</tr>
</tbody>
</table>

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4 The letters in parentheses are abbreviations used below in the citation of specimens.
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Epidermal pores usually surrounded by six rows of cells, distinctly cruciate; marginal scales not present; appendages of median scales minutely and regularly crenulate or denticulate; rays of female receptacle destitute of papillae; basal sinus scarcely or not at all wider than the others.

3. *M. Berteroana.*

Thallus with sclerotic cells: epidermal pores usually surrounded by five to seven rows of cells; marginal scales not present; rays of female receptacle mostly five to nine, rarely more, flat to convex on upper surface, never terete, destitute of papillae; basal sinus usually distinctly wider than the others: cupules destitute of papillae.

Section II. *Chlamidium.*

Stalk of female receptacle with a single band of air-chambers.
Epidermal pores cruciate: appendages of scales entire or slightly toothed: stalk of male receptacle destitute of air-chambers, with two rhizoid-furrows; rays short and broad: stalk of female receptacle with two rhizoid-furrows; rays long and narrow; involucre with ciliate lobes: cupules with dentate lobes.

4. *M. paleacea.*

Epidermal pores not cruciate: stalk of male receptacle with a single band of air-chambers and two to four rhizoid-furrows; rays long and narrow (at maturity): stalk of female receptacle with two to four rhizoid-furrows; involucre vaguely or not at all lobed, entire to ciliate: cupules not lobed, dentate to ciliate. Appendages of ventral scales sparingly crenulate or denticulate: rays of female receptacle short and broad, mostly eleven; involucre ciliate.

5. *M. breviloba.*

Appendages of ventral scales usually closely denticulate or ciliate: rays of female receptacle long and usually narrow. Epidermal pores mostly 90-130 x 70-80μ: rays of female receptacle slightly or not at all dilated at the apex, rarely emarginate; involucre crenulate to ciliate.


Epidermal pores mostly 50-70 x 40-45μ: rays of female receptacle distinctly dilated at the apex, usually emarginate; involucre entire to crenulate.

7. *M. papillata.*

Stalk of female receptacle with two bands of air-chambers and two rhizoid-furrows; rays normally five, short and rounded, not dilated; involucre dentate to ciliate or laciniate: stalk of male receptacle with two rhizoid-furrows: epidermal pores not cruciate: appendages of ventral scales entire to sparingly dentate: cupules not lobed, dentate to ciliate. Thallus thin and very delicate.

8. *M. Bescherellei.*

Thallus usually thick and firm.

Section I. Astromarchantia

I. Marchantia polymorpha L.

Marchantiaumbellata Scop. l. c. 354. 1772.
Marchantia coarctata Corda; Opiz, Beitr. zur Naturg. 647.
1828 (nomen nudum).
Marchantiaelliptica Corda, l. c. 647. 1828 (nomen nudum).
Marchantia Kablichiana Corda, l. c. 647. 1828 (nomen nudum);
Marchantia Syckorae Corda; Nees von Esenbeck, Naturg.
Europ. Leberm. 4: 97. 1838.
1891.

Thallus pale to dark green, not glaucous, sometimes with a brownish or purplish median band on the upper surface, often more or less pigmented with purple on the lower surface, usually 0.75–1.25 cm. wide and 4–6 cm. long, repeatedly dichotomous, the successive forks usually 2 cm. or less apart; texture sometimes delicate, sometimes firm, but never leathery, margin entire or minutely denticulate; epidermis composed of cells with thin or slightly thickened walls, mostly 20–60μ long (averaging about 29μ) and 12–20μ wide (averaging about 16μ), papillae present near the margin or absent altogether; pores (with their surrounding cells) mostly 60–75μ long and 40–60μ wide, sometimes measuring as much as 90×65μ, surrounded usually by four rows of cells (two in each series), each row being usually composed of four cells, inner opening usually four-sided, the sides rarely concave throughout, each bounding cell usually projecting inward in the form of a rounded papilla with subparallel or converging sides, mostly with a resinous deposit; air-chambers low, more or less elongated, their boundaries indistinct when viewed through the epidermis, usually present everywhere (except close to the margin) but sometimes absent from the median region, rows of photosynthetic cells sometimes three cells long but often shorter; compact ventral tissue mostly twelve to twenty cells thick in the median portion, destitute of slime cells and sclerotic cells, the cell walls slightly thickened and showing distinct pits; ventral scales in three rows on each side of the thallus, median and marginal scales in distinct rows, laminar scales in a more indefinite row, scales often more or less pigmented.
with purple, the marginal scales close together though scarcely imbricating, usually projecting beyond the margin; appendages of median scales broadly orbicular, mostly 0.5-0.75 mm. long and 0.6-0.8 mm. wide, rounded to very bluntly pointed, sometimes apiculate, margin usually minutely and irregularly denticulate, sometimes (in hygrophilous forms) tending to be crenulate, cells showing a gradual decrease in size toward the margin, median cells subsidiodiametric, mostly 35-40 μ in diameter, marginal cells mostly 20-25 μ long and 14-16 μ wide, sometimes smaller (10-16 μ x 10 μ), cells containing oil-bodies about 20 μ in diameter, usually from five to ten on each appendage, restricted to submarginal (and, rarely, marginal) portions: male receptacle borne on a stalk 1-3 cm. long with two rhizoid-furrows, destitute of dorsal air-chambers, the disc mostly 0.7-1 cm. broad, shortly lobed or merely crenate, the lobes or rays mostly eight (rarely nine or ten), 2 mm. long or less, rounded at the apex with thin wavy margins, covered ventrally with densely imbricated scales in several rows: female receptacle borne on a stalk 2-7 cm. long, with two rhizoid-furrows and a single broad dorsal band of air-chambers, the disc mostly 0.8-1.3 cm. broad, deeply lobed, the lobes or rays spreading at maturity, mostly nine (sometimes ten or eleven), 3-5 mm. long, separated by subequal sinuses, terete, covered over with epidermal papillae; involucre deeply and irregularly lobed, the lobes long-acuminate and ciliate on the margins: spores yellow, 12-15 μ in diameter, nearly smooth; elaters 3-5 μ wide, bispiral: cupules deeply lobed, the lobes acute to acuminate, usually dentate to short-spinose on the sides, outer surface with epidermal papillae. (Figs. 1, 2.)

Throughout the greater part of Europe and in the northern parts of Asia and North America *M. polymorpha* is the only representative of the genus and is exceedingly abundant. It grows in swamps and bogs, on rocks and walls near the ground, on banks and the sides of ditches, in gardens and greenhouses, and on the earth in fields and woods. It is perhaps most luxuriant in bogs and on steep rocky hillsides where a liberal supply of water is available. In the woods it is especially likely to occur where a fire has left a supply of charcoal behind. Toward the south other species of *Marchantia* make their appearance and *M. polymorpha* becomes less abundant. In many places it presents the appearance of being an introduced plant.

A search through the literature shows that the occurrence of *M. polymorpha* south of the equator has been doubted or denied by certain authors. Hooker, 5 for example, about fifty years ago,

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5 See Handb. New Zealand Fl. 545. 1867.

Trans. Conn. Acad., Vol. XXI 16 1917
stated that *M. tabularis* (i. e., *M. Berteroana*) was the southern representative of the northern *M. polymorpha*, thus implying that the latter species was absent from antarctic regions. Stephani is even more definite when he describes the habitat of the species as "Europa, Asia et America septentrionalis." Other authors, however, cite definite stations for *M. polymorpha* from the Southern Hemisphere. It will be sufficient to mention in this connection the recent record by Schiifner for Kerguelen Island, that by Kaalaas for the Crozet Islands, and that by Howe for South Georgia. In the opinion of the present writer the occurrence of the species in South America has been clearly established. Specimens from Ecuador, Bolivia and Patagonia have been carefully studied and have been found to agree in all essential respects with European and North American material. Specimens from Kerguelen Island, collected by the Challenger Expedition, and the specimens from South Georgia cited above have likewise been examined, and have been found equally convincing, but no further statements can be made from personal knowledge regarding the distribution of the species in other parts of the Southern Hemisphere.

On account of the abundance of *M. polymorpha* in the United States and northward it seems inadvisable to give a full list of the North American specimens which have been examined. It is enough to state that the species has been collected in Greenland and other parts of arctic America, in Alaska, in nearly every Canadian province and territory and in nearly every state of the Union. The specimens cited below are from tropical North America and from South America.

**Federal District of Mexico**: Cañada San Magdalena, Contreras, October, 1908, *Barnes & Land* 455, 458 (Y.).

**Oaxaca**: near Miahuatlan, 1895, *E. W. Nelson* 2530 (U. S.).

**Puebla**: banks along Avenida Hidalgo and path to barranca, Tezuitlan, October, 1908, *Barnes & Land* 541, 542 (Y.); Santa Barbara, near Puebla, November, 1909, *Frère Nicolas* 20 (Y.).


*Deutsch. Südpolar-Exped.* 8: 64. 1906.


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Vera Cruz: Orizaba, 1855, F. Müller 2245 (N. Y., listed by Gottsche in Mex. Leverm. 268. 1863); Mirador, April, 1857, C. Mohr (N. Y.); Orizaba, January, 1892, J. G. Smith (N. Y.).


Ecuador: near Baños, R. Spruce (distributed in Hepaticae Spruceanae).


The following additional stations, recorded in the literature, are likewise of interest:


Venezuela: Colonia Tovar, Moritz 134 (listed, but erroneously ascribed to Colombia, in Syn. Hep. 789. 1847; also listed by Hampe in Linnaea 20: 333. 1847).


As its name implies, Marchantia polymorpha is an exceedingly variable species, and a full account of its numerous forms is given by Nees von Esenbeck.¹⁰ He recognizes two principal varieties, A. Communis and B. Alpestris, and under each variety he describes a series of sub-varieties and groups of more inferior rank. A. communis is prevalent at lower altitudes but sometimes ascends to higher elevations in sheltered localities; B. alpestris is restricted to mountainous regions. A. communis is charac-

terized by a lax habit and by female receptacles having elongated rays and long slender stalks; B. alpestris, by a compact habit and by female receptacles having shorter rays and shorter and thicker stalks.

Nees von Esenbeck's varieties and subordinate groups are accepted without question in the Synopsis Hepaticarum, but later

![Diagram of Marchantia polymorpha L.](image)

**Fig. 1. Marchantia polymorpha L.**


writers have largely neglected them. There are two, however, which appear from time to time in local lists and taxonomic works. One of these is A. communis, a aquatica, usually quoted as "var. aquatica Nees," and the other is B. alpestris, quoted as "var. alpestris Nees." The differences between these two so-called varieties are indeed striking. In var. aquatica the thallus shows a distinct median band on the upper surface usually pigmented with purple and associated with the absence of air-
chambers, as Schiffner has pointed out; in var. *alpestris* the thallus is uniformly green on the upper surface, and air-chambers are everywhere present. In var. *aquatica* the margin of the thallus is entire or nearly so, and the upper surface completely lacks epidermal papillae or bears them very rarely; in var. *alpestris* the margin of the thallus is more or less denticulate from projecting cells, and epidermal papillae occur in greater or less abundance in the marginal portions. In var. *aquatica* the appendages of the ventral scales are entire or nearly so, and the spreading rhizoids are smooth; in var. *alpestris* the appendages are distinctly denticulate, and the spreading rhizoids tuberculat.

About fifteen years ago another so-called variety was distinguished by Hagen under the name var. *mamillata*. It was based on a supply of specimens collected by its author at Opdal in Norway and distributed by Schiffner in Hep. Europ. Exsic. 15. Apparently Hagen himself did not publish his variety. Schiffner\(^\text{11}\) did so, however, and quoted Hagen's original diagnosis, as follows: "Cellulae epidermicae et frondis dorsalis et carpocephali acute mamillosae." In commenting on this diagnosis Schiffner showed that the mamillose appearance, so strongly emphasized, was due to epidermal papillae and that these were restricted to the marginal portions of the thallus. He showed further that the female receptacles in all forms of *M. polymorpha* were mamillose in Hagen's sense. Var. *mamillata*, therefore, is based on exceedingly vague characters and has little or nothing to distinguish it from var. *alpestris*.

Although var. *aquatica* and var. *alpestris* are at first sight so distinct from each other they are connected by intermediate forms, and their differences seem to be associated with definite differences in environmental conditions. They represent, therefore, modifications rather than varieties in the taxonomic sense. Probably the most logical disposition to make of them is to regard them as forms, as Müller\(^\text{12}\) has done, and to cite them as forma *aquatica* (Nees) K. Müll. and forma *alpestris* (Nees) K. Müll., respectively. Other forms, less distinct than these, might likewise be distinguished, but it would hardly be a profitable task to designate them by names.

\(^{11}\) *Lotos* 49: 93. 1901.
\(^{12}\) Rabenhorst's *Kryptogamen-Flora* 6: 306. 1907.
Of the various synonyms quoted under *M. polymorpha* the first six require no special mention, since no question has arisen about them for many years. In fact three of these synonyms were never published adequately by their author at all, and nothing would now be known about them if Nees von Esenbeck had not included them among the synonyms of his varieties and forms of *M. polymorpha*. It is perhaps worthy of note, however, that *M. stellata* and *M. umbellata* were based on female and male specimens, respectively, showing how deep an impression the very different receptacles made on the early observers. The last three synonyms deserve a few words of comment.

The first, *M. vittata*, was described from specimens collected by its author on the island of Madeira. It is characterized by the presence of a longitudinal median band on the thallus, deep purple in color, and by a female receptacle bearing three to ten terete rays. The authors of the Synopsis Hepaticarum cite the species but do not number it, thus implying that they doubt its validity. They refer it with some question to one of the varieties of *M. polymorpha*. Although type specimens of *M. vittata* have not been available for study there can be little doubt that the species should be referred to *M. polymorpha* forma *aquatica*, on account of its median purple band. This conclusion is supported by the fact that Schifflner\textsuperscript{13} quotes *M. polymorpha* var. *aquatica* definitely from Madeira, although he makes no mention of *M. vittata*. In fact the writer has found no references to the species later than the date of the Synopsis.

The next species, *M. Syckorae*, was based on female specimens collected by Syckora and by Corda in Bohemia. Nees von Esenbeck, without having seen specimens, gave a description of the species based on Corda's notes and figures. The features emphasized are the stellate female receptacles with terete rays and the monocarpous involucres, each consisting of two distinct membranes divided into six lanceolate acuminate lobes with serrate-dentate margins. In spite of the peculiarities in the involucre Nees von Esenbeck suspected that *M. Syckorae* was nothing but a form of *M. polymorpha*, and yet it is cited and numbered in the Synopsis Hepaticarum. Many years later Dědeček\textsuperscript{14} definitely included *M. Syckorae* among the synonyms

\textsuperscript{14} Arch. Naturw. Landesdurchf. Böhmen, Bot. 5\textsuperscript{a}: 20. 1886.
**Fig. 2. Marchantia polymorpha L.**

of *M. polymorpha* and Schiffner\(^1\) has since followed the same course.

The type material of the last synonym, *M. oregonensis*, consists of a series of male specimens collected on Mount Hood, Oregon, by J. Röll, in 1888. A portion of the type in the Underwood herbarium has been examined by the writer. In his original account of *M. oregonensis*, Stephani emphasizes the dentate and spinose appendages of the ventral scales and states that he knows no other *Marchantia* of temperate regions in which similar appendages occur. Howe\(^2\) soon pointed out, however, that the appendages in many European and American specimens of *M. polymorpha* agreed with those of *M. oregonensis* and expressed the opinion that the peculiarity emphasized by Stephani had no specific significance. Fig. 1, G, drawn from *M. oregonensis*, fully supports Howe's statements. As a matter of fact the appendages are not deeply enough toothed to be called "spinose" or even "dentate"; it would be more accurate to describe them as denticulate or crenulate. In his *Species Hepaticarum*, published the same year as Howe's observations, Stephani\(^3\) still maintains the validity of *M. oregonensis*. He describes the appendages as variously and remotely dentate-spinose and states that they are composed of small subequal cells. Here again Fig. 1, G brings out a slight inaccuracy, by showing that the marginal cells are distinctly smaller than the interior cells. In his critical notes he no longer emphasizes the features of the appendages but calls attention to the cruciate internal openings of the epidermal pores, stating that no other North American species has pores of this character. In the material studied by the writer no pores of a distinctly cruciate type were found; they agreed, rather, with the pores of *M. polymorpha* forma *alpestris*, as shown in Fig. 2, D. Since both of the distinctions relied upon by Stephani thus break down there seems to be no reason why *M. oregonensis* should not be considered a simple synonym of *M. polymorpha*.

\(^1\) Engler & Prantl, Nat. Pflanzenfam. 1\(^3\): 37. 1893.


\(^3\) Bull. Herb. Boissier 7: 531. 1899.
2. Marchantia plicata Nees & Mont.


Thallus green, not glaucous, often more or less pigmented with purple on the lower surface, usually 1-1.5 cm. wide, often 6-8 cm. long or even more, occasionally dichotomous, the successive forks usually about 2 cm. apart, texture delicate, margin entire; epidermis composed of thin-walled cells, averaging about 20\(\mu\) in length and 13\(\mu\) in width, papillae absent; pores (with their surrounding cells) mostly 65-80\(\mu\) long and 50-60\(\mu\) wide, gradually decreasing in size toward the margin, the smallest measuring about 50 x 40\(\mu\), surrounded by three or (usually) four rows of cells (two rows being in the lower series), each row being usually composed of four cells, inner opening mostly four-sided, with slightly convex to distinctly concave sides, somewhat roughened by a resinous deposit; air-chambers low, isodiametric or somewhat elongated, their boundaries very indistinct when viewed through the epidermis, everywhere present (except close to the margin), rows of photosynthetic cells usually less than three cells long; compact ventral tissue mostly twenty to twenty-five cells thick in the median portion, destitute of slime cells and sclerotic cells, the cell-walls slightly thickened and with distinct pits; ventral scales in four to six rows on each side of the thallus, median and marginal scales in distinct rows, laminar scales in two to four indistinct rows, scales often pigmented with purple, marginal scales more or less imbricated and usually projecting beyond the margin; appendages of median scales orbicular-ovate to orbicular, mostly 0.65-0.9 mm. long and 0.65-0.8 mm. wide, somewhat narrowed toward the rounded and sometimes apiculate apex, margin minutely and irregularly denticulate or crenulate, a tooth sometimes consisting of an entire cell borne on a slightly projecting stalk cell, cells rapidly decreasing in size toward the margin, median cells mostly 70-90\(\mu\) in length and 40-60\(\mu\) in width, marginal cells only 25-50\(\mu\) in length and 12-20\(\mu\) in width, cells containing oil-bodies 15-30\(\mu\) in diameter, usually about ten on each appendage, restricted to submarginal portions: male receptacle borne on a stalk 2-3 cm. long, with two rhizoid-furrows, destitute of dorsal air-chambers, the disc mostly 1-1.2 cm. broad (when well developed), deeply lobed, the lobes or rays mostly eight (sometimes nine or ten), the two basal rays usually separated by a wider sinus than the others, 2-4 mm. long, rounded at the apex and with thin wavy margins, covered ventrally with
densely imbricated scales in several rows: female receptacle borne on a stalk 6-8 cm. long (when well developed), with two rhizoid-furrows and a single broad dorsal band of air-chambers, the disc mostly 1.2-1.6 cm. broad, deeply lobed, the lobes or rays spreading at maturity, mostly eleven (sometimes nine or ten), 5-6 mm. long, the two basal rays usually shorter than the others and separated by a wider sinus, rays terete, rounded at the apex, destitute of surface-papillae; involucre sometimes pigmented, deeply and irregularly lobed, the lobes long-acuminate and dentate to ciliate on the sides: spores pale yellow, 12-14μ in diameter, smooth or nearly so; elaters 3-5μ wide, bispiral: cupules deeply lobed, the lobes as in M. polymorpha, outer surface with epidermal papillae. (Figs. 3, 4.)

The species seems to be confined to the high mountains of South America. The following specimens have been examined:

**COLOMBIA**: Boqueron, Bogota, W. Weir (N. Y.).

**Ecuador**: Quito, December, 1847, W. Jameson (N. Y., listed by Mitten as M. Berteroana in Jour. Bot. & Kew Misc. 3:361. 1851); Pichincha, R. Spruce (distributed in Hepaticae Spruce-anae).

**Peru**: Cuzco, July, 1911, H. W. Foote (Y., listed by the writer as M. lamellosa in Trans. Conn. Acad. 18:299. 1914); same locality, September, 1914, Mr. & Mrs. J. N. Rose 19060 (N. Y., Y.); Ollantaytambo, May, 1915, Cook & Gilbert 672 (U. S., Y.); San Miguel, Urubamba Valley, June, 1915, Cook & Gilbert 1162 (U. S., Y.); Lucumayo Valley, June, 1915, Cook & Gilbert 1321 (U. S., Y.).

**Bolivia**: between Chupé and Janacáché, province of Yungas, A. d’Orbigny 209 (M., type); Sorata, February, 1886, H. H. Rusby 3005 in part (N. Y., listed by Spruce as “M. plicata Nees?” in Mem. Torrey Club 1:140. 1890); Songo, November, 1890, M. Bang 910 (N. Y., U. S., Y., listed by Rusby as M. polymorpha in Mem. Torrey Club 4:274. 1895); Sorata, September, 1901, R. S. Williams 2144 (N. Y., Y.).

The type specimen of M. lamellosa was collected at the following locality:

**Venezuela**: Paramo de Mucuchies, Moritz 45 (listed, but erroneously ascribed to Colombia, in Syn. Hep. 527. 1846; also listed by Hampe in Linnaea 20:333. 1847).
The present species was based on a specimen without receptacles or gemmae. When originally described its generic position was considered doubtful, but the authors of the Synopsis saw clearly that it represented a *Marchantia* and suggested its relationship to *M. polymorpha*. Unfortunately the absence of receptacles made a positive conclusion impossible, and they were therefore obliged to place it among the species "incertae sedis." A portion of the type material from the Montagne herbarium, kindly forwarded by M. Paul Hariot, has been carefully com-

**Fig. 3. Marchantia plicata Nees & Mont.**

pared with the other specimens cited above. The epidermal cells are unusually delicate and are slightly smaller than the averages given, measuring perhaps $18 \times 10\mu$, but the epidermal pores and ventral scales agree very closely with those of the other specimens. It is clear, therefore, in the writer's opinion, that all the specimens cited represent the same species.

The original material of *M. lamellosa* has not been available for study, but the specimen from Colombia, listed above, was referred to this species by Mitten and is evidently the same as the specimens from Ecuador, Peru, and Bolivia. On the basis of this specimen and the full description in the Synopsis Hepaticarum, *M. lamellosa* is here reduced to synonymy. It should be noted, however, that Stephani considers it valid, so that this reduction is perhaps unwarranted. He ascribes to the species cruciate pores and papillate rays on the female receptacles. In one of the Peruvian specimens, No. 672, some of the pores are as cruciate as those of *M. oregonensis*, but other pores are not cruciate at all, so that a considerable range of variation is present. The lack of receptacles in these specimens makes it impossible to determine whether papillate rays are associated with pores which approach the cruciate condition, although the constant absence of papillae in all the fruiting specimens studied, which are clearly the same as No. 672, makes such an association improbable. Even if papillae occasionally occurred they would hardly afford a basis for a specific separation. Stephani cites *M. lamellosa* from the type locality and also from Ecuador (Chimborazo and Altar, *Hans Meyer*). He cites *M. plicata* from the type locality, from Ecuador (*Quito, Ortoneda, Spruce*), from Colombia (*Lindig*), and from Venezuela (*Merida, Moritz*). It is probable that the Lindig specimens are those listed by Gottsche under *M. polymorpha* and that the Moritz specimens are those doubtfully referred by Hampe to *M. Berteroana*. Of course, in the absence of the specimens themselves, this matter can not be definitely decided.

Although *M. plicata* and *M. polymorpha* are closely related species it is usually easy to distinguish them. Some of the differential characters, however, are vague and subject to variation. When *M. plicata* is well developed the thallus and the

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19 Linnaea 20: 333. 1847.
sexual receptacles are larger than in the most robust forms of *M. polymorpha*, approaching or equalling in this respect the more southern *M. Berteroana*. The thallus also shows a tendency to fork at infrequent intervals, so that it presents the appearance of being more elongated than in *M. polymorpha*.

The lack of epidermal papillae on the rays of the female receptacle seems also to be a distinguishing character. In fact paperillae of this type are restricted to the outer surface of the cupules. In spite of the large size of the thallus the epidermis of *M. plicata* is unusually delicate in texture and the air-chambers unusually low.

The ventral scales exhibit considerable variation with respect to size and amount of pigmentation. In typical examples the ventral surface is almost covered with purple scales, but this condition is by no means constant; the scales may only partially cover over the surface and the pigmentation may be very slight.
The crowded marginal scales, however, visible from above, seem to be a constant feature, although these scales may not be any more conspicuous than in *M. polymorpha*. The appendages of the ventral scales, as in other species, yield some of the most important characters (Fig. 3). The small marginal cells are exceedingly irregular, forming various angles with the periphery of the appendage and often projecting in the form of blunt teeth. Frequently a projecting cell will be borne on a broader basal cell, a two-celled tooth of a peculiar type being thus produced. Usually the difference in size between the marginal cells and the interior cells is very marked, but the difference is less when the appendages are poorly developed (Fig. 3, A). The apices of the appendages are especially variable. In some cases a distinct apical tooth two cells long is present, making the appendage apiculate (Fig. 3, F); in other cases the apical tooth is hardly distinguishable from the neighboring teeth (Fig. 3, G); in still other cases there is no indication whatever of an apical tooth (Fig. 3, H, I).

When the appendages are compared with those of *M. polymorpha* they are found to have many features in common. In both species they are similar in form and show a decrease in the size of the cells in passing from the middle to the margin; in both species the apex is variable and the margin is normally denticulate. In *M. plicata*, however, the cells are larger and the decrease in size more abrupt, the denticulation tends to be more pronounced, owing largely to the frequency of two-celled teeth; and the marginal cells tend to be more irregular. Although these differences are of a comparative nature and subject to variation, they will usually be found serviceable in separating the species.


Thallus green or bluish green, sometimes glaucous, often more or less pigmented with purple or brownish near the margin and on the lower surface, usually 1-1.5 cm. wide and 6-8 cm. long,
American Species of Marchantia. 247

variously dichotomous, the successive forks sometimes 2-3 cm. apart but often closer together, texture usually tough and leathery, margin entire or minutely and irregularly denticulate or crenulate, more or less plicate; epidermis composed of cells with thin or slightly thickened walls, mostly 20-60μ long (averaging about 32μ) and 16-24μ wide (averaging about 19μ), papillae absent; pores (with their surrounding cells) mostly 60-80μ long and 50-60μ wide, surrounded usually by six rows of cells (three in each series), each row being usually composed of four cells, inner opening cruciate, the bounding cells commonly four (rarely three or five), slightly roughened; air-chambers of medium height, usually a little longer than broad, their boundaries indistinct when viewed through the epidermis, present everywhere, rows of photosynthetic cells usually three or four cells long; compact ventral tissue about twenty-five cells thick in the median portion, destitute of slime cells and sclerotic cells, usually thin-walled and with indistinct pits; ventral scales in two rows, median and laminar, no marginal scales being present, scarcely imbricated, pale or brownish; appendages of median scales orbicular-ovate to broadly orbicular, usually somewhat narrowed toward the rounded apex, mostly 0.6-1 mm. in length and about the same in width, margin minutely and often regularly crenulate or denticulate from projecting cells, cells showing an abrupt decrease in size toward the margin, median cells mostly 60-85μ long and 20-40μ wide, marginal cells (in one, two, or three rows) mostly 12-20μ long and 8-12μ wide, cells containing oil-bodies about 20μ in diameter, about five on each appendage, restricted to submarginal portions; male receptacle borne on a stalk 1-5 cm. long with two rhizoid-furrows, destitute of dorsal air-chambers, the disc about 1 cm. in diameter, more or less deeply lobed when well developed, the lobes or rays mostly eight, usually 2-3 mm. long, rounded at the apex and with thin wavy margins, covered ventrally (except in the marginal portions) with imbricated scales in several rows, sinuses usually subequal in width: female receptacle borne on a stalk mostly 3-8 cm. in length, with two rhizoid-furrows and a broad dorsal band of air-chambers, the disc mostly 0.8-1 cm. broad, deeply lobed, the lobes or rays spreading at maturity, mostly nine, 2-3 mm. long, separated by subequal sinuses, terete, rounded, destitute of epidermal papillae; involucre much as in M. polymorpha: spores brownish yellow, mostly 8-10μ in diameter, smooth; elaters about 5μ wide, bispiral: cupules deeply lobed, the lobes as in M. polymorpha, outer surface with epidermal papillae. (Fig. 5.)

A widely distributed species, restricted (according to our present knowledge) to the Southern Hemisphere. The following South American specimens have been examined:
Argentina: Buenos Aires, without date, Twiedie (H.); La Plata, collector and date unknown (H.).

Chile: Concepcion, November, 1905, R. Thaxter, 16, 66 (H., Y.); Port Corral, January, 1906, R. Thaxter, 62, 74, 92 (H., Y.); Hermite Island, Cape Horn, 1843, J. H. Hooker (H.).

Juan Fernandez: without definite localities, 1830, C. Bertero (H., N. Y., type); H. N. Moseley (N. Y., Challenger Expedition); 1901, G. T. Hastings 218 (N. Y., U. S.).

Falkland Islands: without definite locality, 1843, J. D. Hooker (H.).

The following specimens from other regions have likewise been examined:


Cape Colony: Table Mountain, F. Krauss (N. Y.); Montague Pass, J. C. Bruetel (N. Y.); without definite localities or dates, W. H. Harvey (N. Y.), Capt. Rabenhorst (Y.).

Australia: Victoria, Robertson 633 (N. Y.); Swan River, 1846, J. Drummond (H.); without definite locality, F. von Müller (H., Y.).

Tasmania: without definite localities, 1823, Lawrence (N. Y.); 1838, R. Gunn (N. Y.); no date, W. Archer (N. Y.); western mountains, no date, Lawrence (N. Y.); Tasman Peninsula, roadside from Long Bay to Tarrand, February, 1899, 1956b (H., distributed by E. Levier as M. cephaloscypha).

New Zealand: without definite localities, no date, A. Sinclair (N. Y.); 1881, E. Craig (Y.); no date, J. Remy (N. Y., distributed by C. Roumeguere as M. nitida); Waiketi, A. Sinclair (H.); Raipara, 1850, S. Mossmann (H.); Point Cooper, collector and date unknown (N. Y.); North Island, 1904, W. A. Setchell 32 (Y.); Lord Auckland’s Group, November, 1840, J. D. Hooker (H.); Campbell Island, November, 1840, J. D. Hooker (H.); without definite locality, date, or collector’s name (B., type of M. cephaloscypha).

Other South American stations of interest, cited in the literature, are the following:
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The identity of *M. Berteroana* and *M. tabularis* was established by Schiffner, although Nees von Esenbeck, in proposing *M. tabularis*, recognized its close relationship with the older species. *M. Berteroana* was based on specimens collected by Bertero on the island of Juan Fernandez, while the type material of *M. tabularis* came from Table Mountain in Cape Colony. The Synopsis Hepaticarum recognizes both species; it cites *M. Berteroana* from Chile and St. Helena, as well as from the type locality, and gives Devil's Peak in Cape Colony as a second station for *M. tabularis*. Under *M. Berteroana* three varieties are recognized: a, from Juan Fernandez, β, biflora, from Chile; and γ, anactis, from Juan Fernandez and St. Helena. In a, according to the description, the rays of the female receptacle are one third longer than the involucre, the latter enclosing three to five flowers; in β, the rays are the same as in a but are fibrillose, while the involucre usually contain only two flowers; in γ, the rays do not project beyond the involucre at all.

In discussing *M. Berteroana*, Schiffner\(^2\) points out that the differences relied upon by Nees von Esenbeck in separating *M. tabularis* are of no significance and that the same thing is true of the differential characters assigned to the three varieties of *M. Berteroana*. He points out further certain mistakes in the original description of this species and also in the description given in the Synopsis. He based his conclusions on a large series of original and authentic specimens, several of which have been studied by the present writer, and there seems to be no reason for doubting the accuracy of his observations.

Schiffner was apparently the first to give a satisfactory description of the scale appendages in *M. Berteroana*. He calls attention to the finely crenulate margin, to the border of very small cells in one or two rows, and to the sharp distinction in size between

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the marginal cells and the cells which adjoin them. To \textit{M. polymorphpha} he assigns appendages which are minutely but sharply denticulate, and adds that the cells gradually increase in size in passing from the margin to the median portion. In most cases the distinctions given by Schiffner apply very definitely, but in the forma \textit{aquatica} of \textit{M. polymorphpha} (Fig. 1, E, F) the appendages are usually destitute of distinct denticulations, the

\textbf{Fig. 5. \textit{Marchantia Berteroana} Lehm. \& Lindenb.}

entire or crenulate margin closely simulating that of *M. Berteroana*. Even here, however, the gradual decrease in the size of the cells as the margin is approached is in contrast to the abrupt decrease found in *M. Berteroana*.

In habit and in general appearance *M. Berteroana* resembles *M. polymorpha* very closely, and it is not surprising that the early observers failed to distinguish it as a species. The thallus, to be sure, is more robust, it tends to be thicker and more leathery than in the northern species, and the rays of the female receptacle tend to be shorter, but these differences are not always pronounced. There are, however, several distinctive features, in addition to the scale-appendages, which deserve to be emphasized. In the first place *M. Berteroana* seems to lack marginal scales altogether. Sometimes the laminar scales form a vague double row, some of the scales being nearer the margin than the others, but even under these conditions there is quite a little space between the outermost scales and the margin. In most cases the row of laminar scales is more definite and the region without scales is consequently wider. In *M. polymorpha* the marginal scales are apparently always present, although they do not always attain the same degree of development. *M. Berteroana* is further distinguished by its cruciate epidermal pores, and by its lack of epidermal papillae on both thallus and female receptacle. The lack of marginal scales, the crenulate scale appendages, and the cruciate pores will serve also to distinguish *M. Berteroana* from *M. plicata*, although there is no evidence as yet that their ranges overlap.

The writer has fortunately been able to examine an original specimen of *M. cephaloscypha*. The species was based on gemmiparous material with young female receptacles collected somewhere in New Zealand, neither the date nor the collector's name being given. A few years later Stephani\(^2\) referred to his species a series of specimens from various parts of Australia and was able to add the characters derived from mature female receptacles and ripe capsules. In his *Species Hepaticarum*,\(^2\) in addition to New Zealand and Australia, he cites Tasmania, Fuegia, Patagonia and Chile as localities for the plant and notes that it is not

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\(^2\) Hedwigia **28**: 265. 1889.
rare. Still later he\textsuperscript{23} quotes stations on Juan Fernandez, the Chilean island of Chiloé, and the Falkland Islands. He therefore gives the species a very extensive distribution in the Southern Hemisphere. It has already been noted that he does not credit \textit{M. Berteroana} to America at all, the only specimens which he cites being from Cape Colony, the Transvaal, and the island of St. Helena.

In his descriptions of \textit{M. cephaloscypha} Stephani emphasizes the cruciate pores, the large scale-appendages bordered with very small cells, the nine-rayed female receptacles with smooth and terete rays, the eight-lobed male receptacles, and the spinose cupules. It will at once be noted that all of these features are found in \textit{M. Berteroana}. There are, however, certain discrepancies between Stephani’s descriptions and the account of \textit{M. Berteroana} given above. He states, for example, in his original description that the cupules are contracted at base and apex and that the ventral scales are in three rows on each side of the thallus, one row of tongue-shaped scales being close to the margin. In his last description he still emphasizes the contracted apices of the cupules but makes no allusion to the three rows of ventral scales, perhaps because he has already given a triseriate arrangement of the scales as a generic character.

The type specimen shows that some of the specific characters emphasized by Stephani are based on misconceptions. The single cupule present, for example, is contracted at the throat but flares widely at the mouth. Even if the mouth itself were contracted this condition might easily be due to immaturity and figures of a young cupule of \textit{M. polymorpha} by Mirbel,\textsuperscript{24} in which the mouth is distinctly contracted, fully support this view. There are, moreover, no marginal ventral scales, although the margin, being irregularly crispate, produces the effect of scales. The appendages of the median scales are slightly crenulate and show one or two rows of marginal cells, the rays number nine in the female receptacle and are destitute of papillae, the surface of the cupule bears numerous papillae, and the pores are of the cruciate type. The writer therefore feels justified in considering \textit{M. cephaloscypha} a simple synonym of \textit{M. Berteroana}.

\textsuperscript{23} Kungl. Svensk. Vetensk.-Akad. Handl. 46\textsuperscript{o}: 5. 1911.
\textsuperscript{24} Mém. Acad. Sci. 13: pl. 4, f. 31, 32. 1835.
Section II. Chlamidium

4. Marchantia paleacea Bertol.


Fimbriaria paleacea Corda; Opiz, Beitr. zur Naturg. 648. 1828.
Fegatella Micheliï Corda, l. c. 649. 1828 (according to Nees von Esenbeck).

Marchantia nitida Lehm. & Lindenb. l. c. 11. 1832.
Marchantia squamosa Raddi; Lehm. & Lindenb. l. c. 12. 1832 (as to the East Indian plant).

Marchantia planipora Steph. l. c. 98. 1897.

Thallus pale green, often glaucous, sometimes more or less pigmented with purple, especially near the margin and on the lower surface, usually 0.5-0.8 cm. wide and 2-4 cm. long, repeatedly dichotomous, the successive forks usually 1 cm. or less apart; texture firm but scarcely leathery, margin entire; epidermis composed of cells with more or less thickened walls, sometimes in two layers, mostly 35-70 µ long (averaging about 43µ) and 20-40 µ wide (averaging about 30 µ), papillae absent; pores (with their surrounding cells) mostly 70-90 µ long and 65-85 µ wide, sometimes measuring as much as 140 x 100 µ, surrounded usually by six (or seven) rows of cells (three in the upper and three or four in the lower series), each row being usually composed of four cells or the innermost row of the upper series of from four to eight cells, inner opening cruciate, the bounding cells smooth; air-chambers usually high, isodiametric or slightly elongated, their boundaries indistinct when viewed through the epidermis, present everywhere, rows of photosynthetic cells often six or seven cells long but sometimes shorter; compact ventral tissue mostly twenty to thirty cells thick in the median portion, the walls sometimes pigmented, more or less thickened and showing distinct pits, sclerotic cells usually distinct, scattered, ten to twenty in a cross-section of thallus, more abundant in median region but not confined to this, slime-cells sometimes lacking, sometimes more or less abundant, especially toward the margin; ventral scales in two distinct rows, the laminar scales alternating with the median and only a little nearer
the margin; appendages of median scales oblong, ovate, or ovate-orbicular, mostly 0.6-0.75 mm. long and 0.45-0.6 mm. wide, usually narrowed toward the rounded, obtuse or acute apex, margin entire or vaguely and irregularly denticulate or dentate, rarely with a basal lobe, cells showing a slight and gradual decrease in size toward the margin, median cells isodiametric to distinctly longer than broad, mostly 25-60μ long and 20-30μ wide, marginal cells mostly 30-40μ long and 12-20μ wide, very irregular, the long axis sometimes parallel with the margin and sometimes at an angle with it, cells containing oil-bodies sometimes absent altogether, when present about 20μ in diameter, one to three or more in number and indefinite in position: male receptacle borne on a stalk 5-7 mm. high, with two rhizoid-furrows, destitute of dorsal air-chambers, the disc 5-6 mm. broad, very shortly or sometimes (according to Schiffner) more deeply eight- (to twelve-) lobed, the lobes or rays rounded and with a thin wavy margin, ventral scales restricted to middle portion of disc: female receptacle borne on a stalk 2-4 cm. high, with two rhizoid-furrows and a single broad dorsal band of air-chambers, the disc about 0.5 cm. broad, usually nine-lobed, the lobes or rays spreading at maturity, 0.8-1.2 mm. long, separated by subequal sinuses or with the deep sinus between the basal ray broader than the others, flat, dilated at the truncate or emarginate apex, disc with a median hemispherical or papilliform protuberance about 0.5 mm. in diameter and nine distinct ridges corresponding with the rays; involucre much as in M. polymorpha: spores brownish yellow, about 34μ in diameter, with a narrow hyaline margin about 2μ wide, outer face bearing a series of low lamellae sometimes forming an indistinct reticulum; elaters mostly 6-8μ wide, bispiral; cupules with toothed lobes much as in M. polymorpha, but lacking epidermal papillae. (Figs. 6-8.)

A widely distributed species in tropical and subtropical regions. The following North American specimens have been examined:

**Arizona**: Huachuca Mountains, 1910, L. N. Gooding 824 (N. Y.).

**Puebla**: Puebla, 1906, Frère Arsène (N. Y.); Honey Station, October, 1908, Barnes & Land 507 (Y.); banks along Avenida Hidalgo and path to barranca, Tezuitlan, Barnes & Land 544 (Y.); Santa Barbara, near Puebla, November, 1909, Frère Nicolas 3 (Y.).

**Vera Cruz**: Orizaba, 1855, F. Müller 2245 in part (N. Y.); walls of Lost River sink, Orizaba, November, 1908, Barnes & Land 668 (Y.).

**Guatemala**: Coban, Alta Verapaz, 1310 m. alt., 1892, H. von Tuerckheim 4960 (N. Y.).
Cuba: without definite locality, C. Wright (H., N. Y., Y.), distributed in Hep. Cubenses as M. domingensis; La Perla, Oriente, 600-660 m. alt., February, 1911, J. A. Shafer 9096 (N. Y., Y.); Monte Verde, Oriente, on walls of the ruined mansion of Lescaille, where Wright lived, August, 1913, Brother Leon 4089 (N. Y.).

Jamaica: Whitfield Hall Plantation, December, 1896, W. Harris 11063 in part (N. Y.); along path from Cinchona to Clyde River, July, 1903, A. W. Evans 14 (Y.); vicinity of Cinchona, February, 1905, C. E. Cummings 29, 31 (N. Y., Y.); Mabess Road, May, 1906, D. S. Johnson 46 (Y.).

The following specimens from Europe, the Azores, and Asia have likewise been examined:

France: Mentone, November, 1864, I. T. Moggridge (N. Y.).

Italy: without definite locality, G. Raddi (N. Y., labeled M. papillata β italic); Monte Oliveto, near Pegli in Liguria, May, 1851, L. Caldesi (N. Y.); near Genoa, May, 1855, G. de Notaris (N. Y., also distributed in Rabenhorst's Hep. Europ. 27); Ripoli, near Florence, May, 1899, E. Levier (Y., Micheli's locality); Trezzo sull' Adda, province of Milan, July, 1899, F. A. Artaria (C. C. H.; also distributed in Schiffner's Hep. Europ. Exsic. 13).

Azores: San Miguel 1865, F. D. Godman (N. Y.); August, 1894, C. S. Brown, 365 (N. Y.), 366 (N. Y.); August, 1894, W. Trelease 1320 (N. Y.), 1321 (N. Y.); May and June, 1898, B. Carriero 713, 718 (Y.). The specimens collected by Brown and Trelease have been listed by Trelease in Rept. Missouri Bot. Gard. 8:187. 1897. The following specimens, however, although listed under M. paleacea, should be referred to Conocephalum conicum (L.) Dumort.: C. S. Brown 367 (from San Miguel), 368 (from Fayal), 369 (from Pico) and W. Trelease 1317 (from Terceira). A specimen collected by B. Carriero at Furnas, in 1888, has been reported by Schiffner in Oesterr. Bot. Zeitschr. 51:116. 1901.

China: Szechwan, no date, E. Faber 1110 (N. Y.).

India: (including Nepal): Northwest Himalayas, no date, H. Falconer 1073 (N. Y., U. S., Y.); J. F. Royle (N. Y.); Nepal, N. Wallich (N. Y., types of M. nepalensis, M. nitida, and M. squamosa); Shagak Valley, 1847, T. Thomson 1661, 1663 (N.
Y.); Kumaon, Strachey & Winterbottom (N. Y., listed by Strachey, as *M. paleacea* and *M. nitida*, in Cat. Pl. Kumaon, 234. 1906); Musooric (Northwest Himalayas), Arnigadh, December, 1895, *W. Gollan 210* (N. Y., Y., distributed by E. Levier as *M. nepalensis*).


**Java**: Mt. Pangerango, April, 1894, *V. Schiffner* (Y., distributed as *M. nitida* in Iter Ind. 59).

Within recent years *M. paleacea* has been recorded from the Caucasus, from Dalmatia, Spain and Portugal, and from Morocco. Although the writer has seen no specimens from any of these countries, there can be little doubt regarding the correctness of the determinations. Some of the records for *M. nitida*, however, are open to suspicion. This species has been reported from the Philippines, Tahiti, Samoa and New Zealand, as well as from the Fiji and Hawaiian Islands. Specimens from the first four of these localities, which have been determined as *M. nitida*, have been examined and are, in the writer's opinion, referable to other species. No specimens from either the Fiji or the Hawaiian Islands have been available for study.

Although *M. paleacea* is here reported from a number of North American localities it is remarkable that there are no earlier records for the species from America. In fact the only trustworthy records for *M. tholophora*, here considered a synonym of *M. paleacea*, are the following:
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Oaxaca: near Oaxaca, Sommerschu (the type-locality); Chinantla, F. Liebmann (listed by Gottsche in Mex. Leverm. 1863).

It has already been noted that *M. paleacea* was distinguished by the Florentine botanist Micheli as long ago as 1729. His

![Diagram of Marchantia paleacea Bertol.](image)

Fig. 6. *Marchantia paleacea* Bertol.


figure brings out clearly the general habit of the plant and many of the features of the cupules and female receptacles. The rays of the latter are shown to be flat at their extremities, and the center of the disc is marked by a distinct rounded elevation. In the only receptacles where the rays can be counted ten or eleven are represented, but one receptacle in profile shows only four rays, indicating that sometimes at least fewer than ten rays were present in the material figured. It is now admitted that the
normal number of rays is nine. Micheli, in his description, emphasizes the glaucous color of the thallus. The species is still abundant in the vicinity of Florence, where it was originally collected, and specimens from this region are among those cited above.

Bertolini's description is drawn from female plants, and he distinctly states that both male receptacles and cupules were unknown to him. His material came from the vicinity of Chiavari in Liguria. He adds very little to Micheli's account, but gives the number of rays definitely as ten and notes that their extremities are obtuse or almost truncate. Apparently his species was not very widely known at first because neither Raddi nor Lehmann and Lindenberg make any allusion to it. Raddi's *M. papillata β italic* was based on Micheli's description and figure and on specimens collected at Micheli's original locality. *M. nepalensis* and *M. nitida* were based on material collected by Wallich in Nepal and *M. squamosa* on two specimens, one collected by Wallich in Nepal and the other by Raddi in Brazil.

In 1835 Taylor\(^{25}\) accepted *M. paleacea* as a species and referred to it not only the Italian specimens originally cited but also specimens from Nepal collected by Wallich. Although there seem to be no specimens in the Taylor herbarium labeled "*M. paleacea*", there are two with a manuscript name of Taylor's from the Wallich collection. In one case *M. nitida* is given as a synonym and *M. squamosa* as a doubtful synonym, so that these specimens probably represent the *M. paleacea* of Taylor's paper. Unfortunately his figures and description do not correspond in all respects with authentic specimens of the species in question and have therefore given rise to considerable confusion. The most marked discrepancy is in his account of the female receptacles, where the number of involucres is given as four to six, instead of eight (corresponding with nine rays), but an error of this sort might easily be made if poor material was examined. Taylor's specimens are, indeed, imperfectly developed, but they show the thallus characters of *M. paleacea* very clearly, and his determination may therefore be considered correct.

In proposing *M. tholophora* as a species Bischoff makes no mention of *M. paleacea* or of the various species based on

\(^{25}\) Trans. Linn. Soc. 17: 378. pl. 12, f. 3. 1835.
Wallich's specimens, so that the works of Bertolinii and of Lehmann and Lindenberg may have been unknown to him. His description was drawn from Sommerschuh's material, collected near Oaxaca, Mexico, and is unusually detailed. The species is recognized as valid by subsequent writers, the authors of the Synopsis Hepaticarum placing it next to *M. nitida* and Stephani following their example. The original material has not been available for study. Bischoff's description, however, and the
figure which he\textsuperscript{26} afterwards published show almost beyond a
doubt that the species represents a synonym of \textit{M. paleacea}.
This conclusion seems further warranted by the fact that the true \textit{M. paleacea} is now known from several Mexican localities.

Nees von Esenbeck, in describing \textit{M. paleacea}, places it in the
section \textit{Chlamidium} and calls especial attention to the features of
the female receptacle. He gives the normal number of rays as nine and mentions the median protuberance of the disc and
the dilated apices of the rays. Among the synonyms of the
species he includes \textit{M. nitida} without question, basing his opinion on specimens received directly from Lindenberg. He quotes a statement of the latter author to the effect that \textit{M. nitida} is
very close to the Italian \textit{M. paleacea} and perhaps identical with it, accompanied by the remark that \textit{M. paleacea} had not been seen by him when he published \textit{M. nitida} as a new species. Nees von
Esenbeck hesitates somewhat in the case of Taylor’s \textit{M. paleacea}
but inclines toward the opinion that this plant also must be the
same as Bertolini’s species.

In spite of these statements \textit{M. nitida} is reinstated as a valid
species in the Synopsis Hepaticarum and Taylor’s \textit{M. paleacea},
so far as the Nepal specimens are concerned, is given as a synonym under it, the range of \textit{M. paleacea} being again restricted
to Italy. Both \textit{M. nepalensis} and \textit{M. squamosa} are likewise accepted as valid and these two species, together with \textit{M. paleacea}
and \textit{M. nitida}, are included under the section \textit{Chlamidium}. Many
years later, in 1899, Stephani,\textsuperscript{27} in recognizing these four species, placed \textit{M. nitida} and \textit{M. nepalensis} in his section with unsymmetrical receptacles, while he placed \textit{M. paleacea} and \textit{M. squamosa} in the section with symmetrical receptacles.

In 1898 doubt was again thrown on the validity of \textit{M. nitida}
by Schiffner,\textsuperscript{28} who stated that it was probably synonymous with
\textit{M. paleacea}. Two years later he reaffirmed this idea and added that \textit{M. calcarata} Steph., according to a specimen in his herbarium, was surely identical with \textit{M. nitida}.\textsuperscript{29}

\textsuperscript{26} Handb. Bot. Term. und Systemk. 2: pl. 55, f. 2727. 1842.
\textsuperscript{29} Fl. de Buitenzorg 4: 31. 1900. A specimen in the writer’s herbarium, collected by the Abbé Faurie at Tokyo, Japan, and distributed (Hép. du Japon 2360) under the name \textit{M. calcarata}, represents \textit{M. polymorpha}. Stephani himself now regards the true \textit{M. calcarata} as a synonym of \textit{M. diptera} Mont., a species which evidently requires further study.
he maintained still more definitely that *M. paleacea* and *M. nitida* were identical and stated further that in his opinion *M. nepalensis* also would have to be considered a synonym.\(^3\) He criticised Stephani for placing *M. paleacea* in one section of the genus, while he placed *M. nepalensis* and *M. nitida* in another, thus implying that their relationship to the Italian species was at best remote.

The writer would agree with Schiffner in his reductions. Type specimens of *M. papillata \(\beta\) italica*, of *M. nepalensis*, and of *M. nitida* have all been available for study. The first and third are in good condition and show close agreement with each other and with the abundant material of *M. paleacea* from other localities. The type specimen of *M. nepalensis* bears very immature female receptacles, but the thallus characters are those of *M. paleacea* and there seems to be no reason for attempting to maintain the species as valid. Two other species quoted above among the synonyms of *M. paleacea* remain to be considered. The first of these is *M. squamosa*. Wallich's specimens of this species are clearly the same as *M. paleacea*, and since these specimens are the ones first quoted by Lehmann and Lindenberg, they might logically be considered the type. It is probable, however, that Raddi originally gave the name *M. squamosa* to his own Brazilian specimens, and this is apparently the view held by Stephani who quotes only the specimens from Brazil. Raddi's specimens have not been seen by the writer. If they should prove distinct from *M. paleacea* it might still be possible to maintain *M. squamosa* as valid. It is unfortunate that Raddi published nothing on his species himself. The second species to be considered is *M. planipora*, which the writer knows from a portion of the type material and from specimens sent by Professor Miyake. These specimens agree with *M. paleacea*, and the descriptions given by Stephani bring out no essential differences.

There is usually little difficulty in distinguishing *M. paleacea* even in the absence of receptacles. At the present time it is the only known North American species in which the epidermal pores constantly conform to the cruciate type. In this respect it agrees with *M. Berteroana* of the Southern Hemisphere, a much larger plant with very different scale-appendages and terete rays on the female receptacle. Aside from the cruciate pores *M. paleacea*
Fig. 8. *Marchantia paleacea* Bertol.

is distinguished from *M. polymorpha* by its somewhat smaller size, by its total lack of epidermal papillae, by having the pores bounded by six or seven rows of cells, by the presence of sclerotic cells, by the flattened rays of the female receptacles, by the lack of marginal scales and by marked differences in the appendages of the median scales. In *M. polymorpha* epidermal papillae are always present on cupules and female receptacles, the pores are surrounded by only four or five rows of cells, there are no sclerotic cells, the rays of the female receptacle are terete, and marginal scales are always present.

The features of the appendages in *M. paleacea* deserve particular attention (Fig. 7, B-L). When a long series is examined, it will be seen that they exhibit marked differences in their apices and margins, although they are almost constantly longer than broad and maintain an oblong or ovate form. The apex is sometimes rounded, sometimes truncate, and sometimes apiculate or even acute, while the margin may be entire throughout, variously toothed, or even provided with a basal lobe. A tooth, on its part, may be the slightest and vaguest projection of a marginal cell, it may be a distinctly projecting cell, or it may consist of a cell borne on a stalk-cell; in some of the broader teeth two adjoining cells may even be involved. It must be admitted, however, that large and complicated teeth are the exception. In commenting on the type specimen of *M. nitida* Schiffner states that the appendages are broadly ovate, less pointed at the apex and scarcely toothed, those of his Javan material being broadly cordate, abruptly pointed and with irregular and distant marginal teeth. These differences, which he considers of little importance, are shown by Fig. 7, J, L, and at first sight are somewhat striking. Since, however, equally extreme conditions are sometimes found on a single specimen, as shown by Fig. 7, G, H, it is evident that Schiffner did not underrate their value. The appendages also vary in the number of cells with oil-bodies which they show. In some cases no such cells are present; in one case as many as ten were counted; in the majority of cases there are from one to three. The gradual decrease in size between the median cells and the marginal cells is usually evident, although the actual measurements are not very different, and a distinct margin is never apparent as in *M. Berteroana*. It may be noted that Stephani assigns smaller mar-
ginal cells to *M. nepalensis*, *M. nitida*, and *M. tholophora*, while he states that the cells of *M. paleacea* are subequal in size, a specific difference which is not supported by actual comparisons. When contrasted with the appendages of *M. polymorpha*, those of *M. paleacea* are seen to be narrower, usually less toothed, and composed of larger cells, which show a less marked decrease in size between the median and marginal regions.

The male receptacles of *M. paleacea* seem to be infrequent. In the few cases seen the receptacles have been remarkably like those of *M. polymorpha*, although borne on shorter stalks. In other words the disc has been shortly eight-lobed with rounded rays and narrow sinuses. According to Schiffner the rays as they grow older become longer and give the disc a palmate appearance. If this is true the male receptacles exhibit a considerable range of variation. The cupules of *M. paleacea*, with their dentate, sharp-pointed lobes, likewise agree with those of *M. polymorpha* and its allies, except that the outer surface is free from epidermal papillae.

When well developed the female receptacle of *M. paleacea* consists of a disc with nine horizontal flat rays borne on an elongated stalk. In many cases the rays are about twenty degrees apart and present the appearance of being symmetrically disposed. Even here, however, the single plane of symmetry is marked by the sinus between the two basal rays, which is much deeper than the others. When the basal rays are separated by a sinus more than twenty degrees wide the plane of symmetry is more apparent and the disc does not show a radial appearance. Since the width of the sinus between the basal rays varies markedly it should not be made the basis for specific separations, although this has evidently been done in the past. The extremities of the rays are variously dilated and are truncate or even emarginate at the apex. In the center of the disc the hemispherical or bluntly conical protuberance is usually distinct, and the same thing is true of the nine rounded ridges extending from the protuberance to the beginnings of the rays. When the receptacle is young or, in some cases, when fertilization has not taken place, the rays do not spread horizontally but extend downward, and usually, under these circumstances, the median protuberance and the radiating ridges are only slightly developed. In fact they are not always distinct even when the rays have assumed
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a horizontal position. Although the normal number of rays in *M. paleacea* is nine, just as in *M. polymorpha*, deviations from this number sometimes occur, a reduced number being associated with poor development.

According to Prescher scattered slime cells of small size are present in the walls of the cupules of *M. paleacea* but are lacking altogether in the thallus and in the female receptacles. Although the thallus sometimes agrees with his account it does not always do so. Cases have been observed in which slime cells formed a rather conspicuous feature of the ventral tissue of the wings, an occasional cell of this character being present even in the thickened median region. In other cases, the slime cells were less abundant. In the male receptacles, which Prescher did not examine, slime cells are fairly numerous. It is evident from these observations that the presence or absence of slime cells can not be utilized in distinguishing *M. paleacea*.

5. Marchantia breviloba sp. nov.

Thallus pale green, more or less glaucous, sometimes a little pigmented with purple, especially near the margin and on the lower surface, mostly 0.5-0.8 cm. wide and 2-5 cm. long, repeatedly dichotomous, the successive forks usually 1-2 cm. apart, texture firm but not leathery, margin entire; epidermis composed of cells with somewhat thickened walls, sometimes in two layers mostly 45-90μ long (averaging about 65μ) and 20-40μ wide (averaging about 28μ), papillae absent; pores (with their surrounding cells) mostly 125-150μ long and 100-120μ wide, surrounded usually by six (or seven) rows of cells (three in each series or sometimes four in the outer series), innermost row of upper series usually composed of four cells, second row of four to eight cells and third row of eight or more cells, each row of lower series usually composed of four cells, inner opening usually four-sided (sometimes three-, five-, or six-sided), the sides being concave and forming acute angles with one another, bounding cells of pore more or less roughened with a resinous deposit; air-chambers usually high, more or less elongated, their outlines very indistinct when viewed through the epidermis, present everywhere, rows of photosynthetic cells often four or five cells long; compact ventral tissue mostly twenty or twenty-five cells thick in the median portion, the walls sometimes pigmented, more or less thickened and showing distinct pits, sclerotic cells distinct, scattered, about forty in a cross-section, largely confined to median region, sometimes as much as 0.7 mm. in length, slime cells about 0.1 mm. in diameter, usually con-
spicuous (often three or four in a cross-section of thallus), scattered but more abundant toward the margin, sometimes present in the walls between air-chambers; ventral scales in two distinct rows, the laminar scales alternating with the median and only a little nearer the margin (a large portion of the ventral surface being free from scales); appendages of median scales ovate to orbicular, mostly 0.5-0.65 mm. long and 0.45-0.55 mm. wide, narrowed toward the rounded, obtuse, or apiculate apex, margin sinuate, sparingly and irregularly crenulate or denticulate from projecting cells, cells showing a gradual decrease in size toward the margin, median cells usually distinctly longer than broad, mostly 60-120μ long and 28-40μ wide, marginal cells mostly 30-50μ long and 18-25μ wide, irregular, the long axis usually forming an angle with the margin, rarely parallel with it, cells containing oil-bodies lacking: male receptacle borne on a stalk 1.5-2 cm. high, with two to four rhizoid-furrows and a single narrow dorsal band of air-chambers, the disc mostly 1-1.5 cm. broad, deeply six- (or seven-) lobed, the lobes or rays palmately disposed (the basal sinus being almost a straight line), mostly 2-5 mm. long and 1.5 mm. wide, rounded and with a thin wavy margin, ventral scales imbricated, mostly in two rows: female receptacle borne on a stalk 6-8 cm. long, with four rhizoid-furrows (except close to the base) and a single broad dorsal band of air-chambers, the disc mostly 0.6-0.8 cm. broad, usually eleven-lobed, sometimes seven- to nine-lobed, the lobes or rays short, 1 mm. long or less, flat, scarcely or not at all dilated at the truncate apex, basal sinus considerably broader than the others, upper surface of disc plane or with low ridges corresponding with the lobes; involucre ciliate, not lobed; spores yellowish brown, about 34μ in diameter, with a hyaline margin about 4μ wide, outer face bearing a few low lamellae, sometimes forming a very indistinct reticulum; elaters about 8μ wide, bispiral: cupules shortly and irregularly ciliate-dentate, the teeth sometimes adjoining and sometimes separated by sinuses of varying width, mostly two or three cells long and one or two cells wide at the base, epidermal papillae lacking. (Fig. 9.)

The following specimens of this species, which seems to be very local, have been examined:

JAMAICA: without definite localities or dates, Wilds (N. Y., four specimens); Hardware Gap and vicinity, April, 1903, W. R. Maxon 1115 (U. S., Y.); July, 1903, A. W. Evans 175, 203 (Y.); Chestervale, July, 1903, A. W. Evans 211 (Y.); vicinity of Cinchona, March, 1905, C. E. Cummings 28 (N. Y., Y.); St. Catherine's Peak and vicinity, August, 1906, A. W. Evans 441 (Y.). The specimens collected by Wilds include both
female and gemmiparous material. Two, bearing the numbers 5 and 6, are labeled "Marchantia conica"; the other two bear no name. No. 175, collected by the writer, may be designated the type.

The thallus of *M. breviloba* bears a strong resemblance to that of *M. paleacea*, being of about the same size and similarly subject to pigmentation. The ventral scales and the appendages of the median scales in these two species likewise have certain features in common. The arrangement of the scales, for example, is very similar and the appendages agree in form, in the gradual decrease in the size of the cells in passing toward the margin, and in some of the peculiarities of the margin itself. Even the pores look a good deal alike when examined through a lens. A detailed examination, however, quickly brings out points of difference. In *M. breviloba* the pores are not of the cruciate type, the inner opening (so far as observed) being surrounded by evenly bulging cells and thus usually exhibiting a four-sided outline with concave sides and narrow angles; in *M. paleacea* the pores are distinctly cruciate. In *M. breviloba* the cells of the appendages are markedly larger than in *M. paleacea* and oil-containing cells seem to be constantly absent; in *M. paleacea* oil-containing cells can often be detected. In *M. breviloba* slime cells seem always to be numerous and conspicuous; in *M. paleacea* they are less frequent and may be absent altogether: this last difference, unfortunately, is one to be used with caution.

The differential characters yielded by the receptacles and cupules, in separating *M. breviloba* from *M. paleacea*, are even more marked than those derived from the thallus. In *M. breviloba* the male receptacle is borne on a long stalk with a distinct band of air-chambers and usually with four rhizoid-furrows; and the disc is unsymmetrically divided into six or seven elongated lobes, the basal sinus being much broader than the others and often approximating a straight line. In *M. paleacea* the male receptacle is borne on a very short stalk without air-chambers and with only two rhizoid-furrows; while the disc is very shortly and apparently radially divided into eight (or more) often indistinct lobes, the basal sinus being of about the same width as the others.

In *M. breviloba* the stalk of the female receptacle shows four rhizoid-furrows, and the disc is very shortly lobed, the lobes
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being usually more than nine and scarcely if at all dilated at the apex. In *M. paleacea* the stalk of the female receptacle shows only two rhizoid-furrows, and the disc is more deeply divided, the lobes being usually nine (or fewer) and more or less distinctly dilated at the apex; the upper surface of the disc, moreover, shows a median protuberance and nine ridges corresponding with the rays, these structures being very indistinct in *M. breviloba* or absent altogether. In *M. breviloba* the cupule is simply short-ciliate; in *M. paleacea* it shows a series of ciliate or dentate lobes.

There is no difficulty in separating *M. breviloba* from *M. polymorpha*. The new species is smaller, it lacks marginal ventral scales, the appendages of the median scales have larger cells and usually fewer marginal teeth, the epidermal cells are more complex being surrounded by more rows of cells, there are no epidermal papillae, the stalk of the male receptacle has air-chambers and usually more rhizoid-furrows, the disc is more deeply and more unsymmetrically lobed, the stalk of the female receptacle has more rhizoid-furrows, the disc is less deeply lobed, and the lobes are flattened instead of being terete. The difference in the cupules, already noted in connection with *M. paleacea*, would apply equally well in separating the species from *M. polymorpha*.


Not Lehm. & Lindenb.

*Marchantia martinicensis* Spreng.; G. L. N. 1. c. 531. 1847 (as synonym).


*Marchantia caracensis* Steph. l. c. 526. 1899.

Thallus pale to dark green, not glaucous, slightly or not at all pigmented with purple, usually 4-6 mm. wide and 2-3 cm. long, dichotomous, the successive forks usually 1-1.5 cm. apart, texture delicate, margin entire; epidermis composed of cells with
slightly thickened walls, sometimes in two layers, mostly 30-60μ long (averaging about 45μ) and 15-30μ wide (averaging about 23μ), papillae absent; pores (with their surrounding cells) mostly 90-130μ long and 70-80μ wide, surrounded usually by six (or seven) rows of cells (three or four in the upper and three in the lower series), the two lower rows of the upper series usually composed of eight (six to ten) cells apiece (more rarely of only three to five cells), the other rows of four (three to five) cells apiece, inner opening usually four-sided, more rarely three- or five-sided, with the sides straight or nearly so, the bounding cells more or less obscured by a resinous deposit; air-chambers of medium height, isodiametric or somewhat elongated, their boundaries sometimes distinct and sometimes vague when viewed through the epidermis, present everywhere, rows of photosynthetic cells often four or five cells long but sometimes shorter; compact ventral tissue about twenty cells thick in the median portion, the walls sometimes pigmented, more or less thickened and showing distinct pits, sclerotic cells usually distinct, scattered, mostly five to thirty in a cross-section, more abundant in the median portion but sometimes present in the wings, in the latter case often distinctly visible without sectioning, slime-cells lacking; ventral scales in two distinct rows, the laminar scales alternating with the median scales and not much nearer the margin; appendages of the median scales broadly lanceolate to ovate, when well developed mostly 0.35-0.6 mm. long and 0.27-0.45 mm. wide but sometimes considerably smaller, apex apiculate, acute, or cuspidate, margin more or less densely denticulate or dentate, the teeth usually one or two cells long, cells showing a gradual and slight decrease in size toward the margin, median cells usually longer than broad, mostly 40-80μ long and 20-40μ wide, marginal cells mostly 20-40μ long and 15-20μ wide, irregular but the long axis usually at right angles or nearly so to the margin, cells containing oil-bodies apparently always lacking: male receptacle borne on a stalk 5 mm. long or less, with two to four rhizoid-furrows and a single broad dorsal band of air-chambers, the disc variable in size but mostly 6-8 mm. broad, deeply lobed, the lobes or rays usually four to six but sometimes two, three, seven or eight, palmately disposed. the basal sinus a very broad angle or a straight line, mostly 3-6 mm. long and 2-3 mm. wide, rounded, with a thin wavy margin extending across the basal sinus, ventral scales imbricated, in two or more rows; female receptacle borne on a stalk 1.5-2 cm. high, with two to four rhizoid-furrows and a single broad dorsal band of air-chambers, the disc mostly 5-7 mm. wide, the lobes or rays spreading at maturity, extending about half way from the margin to the center, normally seven but often only five or six, more rarely eight to eleven, slightly or not at all dilated at the truncate, irregularly crenate or slightly emarginate apex, upper
surface of disc and rays usually plane but sometimes more or less convex, basal sinus broader than the others and sometimes forming a very obtuse angle; involucre very delicate, the margin minutely and often irregularly crenulate to short-ciliate, the teeth usually varying from one to three cells in length; spores brownish yellow, about 28μ in diameter, the outer face bearing a series of low irregular ridges not forming a network; elaters about 6μ wide, bispiral; cupules closely short-ciliate, the cilia mostly one to four cells long, outer surface without papillae. (Figs. 10-12.)

A widely distributed species in the southern United States, the West Indies, Mexico, Central America, and Venezuela. The following specimens have been examined:

**TENNESSEE:** Etowah, June, 1909, F. McCormick (C. C. H., Y., listed as *M. disjuncta* by the writer in Bryologist 13: 33. 1910).


**ALABAMA:** banks of the Alabama River near Claiborne, W. S. Sullivan (H., type locality of *M. disjuncta*, specimens distributed in Musc. Alleg. 286 and Hep. Bor.-Amer. 128); Auburn, May, 1896, L. M. Underwood (N. Y., Y., distributed, as *M. disjuncta*, in Hep. Amer. 182); June, 1897, Earle & Baker 52 (N. Y.).


**ARKANSAS:** Fort Harvey, no date, F. L. Harvey 2 (N. Y., listed as *M. disjuncta* by Underwood, l. c.).

**MEXICO:** without definite locality or date, C. H. Schultz 1229 (B., listed as *M. papillata*, by Stephani in Bull. Herb. Boissier 7: 397. 1899).

**HIDALGO:** Tula, C. G. Pringle 10675 (Y., distributed in Pl. Mex. under a manuscript name of Stephani).
Alexander W. Evans,

PUEBLA: banks along Avenida Hidalgo and path to barranca, Tezuitlan, 1908, Barnes & Land 553 (Y.).

TAMAULIPAS: near Victoria, June, 1907, E. Palmer 446 (N. Y., Y.).

VERA CRUZ: Orizaba and vicinity, 1855, F. Müller 2373 (N. Y., listed as M. disjuncta by Underwood, l. c.); 1857, C. Mohr (N. Y., Y.); March, 1890, W. Stone 114, 115 (N. Y., listed by Underwood, l. c.); 1892, J. G. Smith (N. Y., Y.); Cordova, 1885, W. G. Farlow 18 (N. Y., listed as M. tholophora by Underwood, l. c. 70).

GUATEMALA: Black River, S. Watson 295b (H., N. Y., listed as M. linearis by Underwood, l. c. 69); near the Finca Sepacuité, Alta Verapaz, March and April, 1902, Cook & Griggs 82, 255, 403 (U. S., Y.).


CUBA: without definite localities or dates, C. Wright (distributed as M. disjuncta and M. linearis in Hep. Cubenses); San Andre, April 14, 1865, C. Wright (H., Y.); valley of the San Juan River, near Matanzas, March, 1903, Britton, Britton & Shafer 326 (N. Y., Y.); Guines, Havana, March, 1905, M. T. Cook (N. Y., Y.); Almendares River, near Puentas Grandes, Havana, April, 1908, Brother Leon 723 (N. Y., Y.); falls of the Habanilla and near Siguanea, Trinidad Mountains, Santa Clara, March, 1910, E. G. Britton 4855, 5076 (N. Y., Y.); vicinity of Guane, Pinar del Rio, March, 1911, Britton, Britton & Cowell 9770 (N. Y., Y.); vicinity of Pinar del Rio, March, 1911, E. G. Britton 10017 (N. Y., Y.); Finca Guerrero, Rio Yayabo, St. Spiritus, Santa Clara, December, 1911, Brother Clement 44 (N. Y., Y.); Banaos Hills, Santa Clara, August, 1913, Brother Leon 4036 (N. Y., Y.); Ensenada de Mora, Oriente, March, 1912, Britton, Cowell & Shafer 13005 (N. Y., Y.).


JAMAICA: without definite locality or date, N. Wilson 595, 611 (N. Y., listed as M. disjuncta by Underwood, l. c.); Hartford and adjoining properties, near Priestman’s River, June,

Porto Rico: Las Marias Road and vicinity of Mayaguez, March, 1906, Britton & Marble 594, 613 (N. Y., Y.); Lares to San Sebastiano, April, 1913, Britton & Marble 2797, 2803 (N. Y., Y.); Rio de Maricao, April, 1913, E. G. Britton 2494 (N. Y., Y.); Ciales, August, 1913, J. R. Johnston 940 (N. Y., Y.); between Arecibo and Utuado, July, 1901, Underwood & Griggs 836 (U. S., Y.); March, 1914, E. G. Britton 2074 (N. Y., Y.); Lares, June, 1901, Underwood & Griggs 36 (U. S., Y.); June, 1914, J. R. Johnston 2070 (N. Y., Y.); Monte Montoso, February, 1915, Britton & Cowell 4177 (N. Y., Y.); La Juanita, near Las Marias, February, 1915, E. G. Britton 3965 (N. Y., Y.); vicinity of Utuado, March, 1915, E. G. Britton 5168, 5112 (N. Y., Y.).


Montserrat: mountain pass to Roches and Tar River, February, 1907, J. A. Shafer 867, 871 (N. Y., Y.).


Dominica: without definite locality or date, W. R. Elliott 1292 (B., type of M. Elliottii).

Martinique: without definite locality, date, or collector's name (M., received from Mérat, type of M. inflexa); without definite locality or date, Sieber 378 (N. Y., probably type of M. martinicensis); St. Pierre and between Deux-Chouxs and Gros-Morne, 1899, 1900, Père Duss 342, 393 (N. Y.); Morne Rouge,

**St. Vincent:** without definite localities or dates, L. Guilding (H., N. Y., specimens in the Taylor and Mitten herbaria, labeled "March. linearis—chenopoda.")

**Grenada:** Annandale, St. George’s, March, 1906, W. E. Broadway (N. Y.).

**Trinidad:** without definite locality, 1878-80, A. Fendler (N. Y., U. S., Y., distributed as *M. chenopoda*); Mareval Valley, 1913, R. Thaxter (H., Y.); La Lenia Valley, 1913, R. Thaxter (H., Y.).

**Venezuela:** Rio Cartude, Caracas, 1856, Gollmer (B., type of *M. caracensis*); Caracas, August, 1902, A. F. Blakeslee, (H., Y.).

The following stations, cited in literature, should also be noted:

**Santo Domingo:** without definite locality, date or collector’s name (type).

**Guadeloupe:** without definite locality or date, *L’Herminier* 69 (listed, as *M. linearis*, by Bescherelle in Jour. de Bot. 7: 193. 1893).

**Martinique:** without definite localities or dates, C. Bélangier 124 (listed, as *M. linearis*, by Bescherelle, l. c.); K. von Martius; C. Bélangier 24 in part, 374; Hahn 774 (the last three listed, as *M. inflexa*, by Bescherelle, l. c.).

The type specimen of *M. domingensis* was collected in Santo Domingo, neither the date nor the collector’s name being mentioned in the original publication. Unfortunately this specimen has not been available for study. In its absence the writer has been obliged to rely upon West Indian material determined as *M. linearis* and upon the type specimen of *M. inflexa*. These are referred to *M. domingensis* without question by Stephani and agree in all essential respects with the other specimens listed. The type specimens of *M. disjuncta*, *M. Elliottii* and *M. caracensis* have likewise been examined and show a similar agreement. The writer feels convinced, therefore, that the synonymy given above is correct.

The type specimen of *M. inflexa*, received from the Montagne herbarium, is very fragmentary but bears two female recep-
tacles: the first shows nine truncate rays clearly, the basal sinus being broader than the others; the second shows ten less clearly marked rays. The type of *M. disjuncta* agrees closely with the specimens distributed by Sullivant, by Austin, and by Underwood. They are well represented in the beautiful figures published by Sullivant, and the female receptacles show a variable number of rays. The type of *M. Elliottii* bears numerous female receptacles, which show from five to nine rays apiece, the rays being plane or slightly convex and blunt. The type of *M. caracensis* bears both cupules and female receptacles, the latter showing five rays apiece. All of these specimens show the dentate scale appendages and other features characteristic of the species.

The thallus of *M. domingensis* is smaller and usually more delicate in texture than in any of the preceding species. In wet localities the photosynthetic layer is especially thin and the epidermis is rarely more than a single cell in thickness, so that plants growing under these conditions present an unusually fragile aspect. The epidermal pores, however, maintain their complex structure and form conspicuous whitish dots on the upper surface. Sometimes the boundaries of the air-chambers show distinctly through the epidermis, but they are usually indistinct. The structure of the pores is much the same as in *M. breviloba*, although the inner opening is bounded by straighter lines.

The sclerotic cells in the thallus exhibit a great deal of variability. When abundantly developed they occur both in the thickened median portion of the thallus and in the wings, those in the latter position showing distinctly as elongated brown spots when examined from underneath. The sclerotic cells appear to be separated from one another by parenchyma when a cross section of a thallus is examined. As a matter of fact, in the median portion of the thallus at least, they often form elongated strands running for a considerable distance, the acute ends of the cells slightly overlapping. There are many cases, however, where the sclerotic cells are very scantily developed. Sometimes there are none at all present in the wings although the median portion still retains them; sometimes even the median portion seems to

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31 Mem. Am. Acad. II. 3: pl. 3. 1846.
lack them completely, although no specimens have yet been seen in which a careful examination failed to show traces of sclerotic cells in this region.

The appendages of the ventral scales (Fig. 10) have better developed teeth than in any other North American species of Marchantia, although the South American M. papillata is a close rival in this respect. The teeth are very irregular, the simplest being single cells which project as rounded or bluntly pointed processes. Between these simple teeth and irregular lobes, several cells long and wide, are all possible gradations. The apical tooth tends to be longer than the others, although this tendency is not always apparent. The median cells of the appendages are often longer than broad and a decrease in the size of the cells

**Fig. 11. Marchantia domingensis Lehm. & Lindenb.**

between the middle portion and the margin is distinctly evident. There is no definite border, however, as in *M. Berteroana*. Sometimes, in wet situations, the appendages remain very small, although even under these circumstances the marginal teeth form a conspicuous feature. The more sharply pointed apices, the larger and more irregular teeth, the larger marginal cells and the lack of cells containing oil-bodies will at once distinguish the appendages of *M. domingensis* from those of *M. polymorpha*.

According to the original description of *M. domingensis* the female receptacle is semicircular and ten-lobed to the middle, the lobes being dilated and emarginate-crenate at the apex. The Synopsis gives the number of lobes as seven to ten, while Stephani states that nine lobes are present. The original description of *M. inflexa* assigns nine to eleven lobes to the receptacle, while Sullivant gives seven to nine as the number of lobes in *M. disjuncta*; here again Stephani places the number of lobes definitely at nine, and gives the same number for *M. Elliottii*. In *M. caracensis*, however, he states that only five or six lobes are present. As a matter of fact the receptacles are exceedingly variable and it is not easy to decide what the typical or normal number of lobes really is. In the material from the mainland seven is perhaps the usual number but five lobes often occur and more than seven have been observed in several instances. In the West Indian material nine lobes are present more frequently, but seven or even only five lobes are not unusual. Sometimes the lobes seem to be subdivided, so that it is not always easy to count them except by means of the involucres which alternate with them. The lobes vary not only in number but in thickness. In some cases they are very thin and flat, in other cases thicker and convex. When the lobes are fleshy the center of the disc sometimes shows a low swelling, but it is usually plane, and the receptacle never shows the conspicuous median protuberance and radiating ridges which are so characteristic of *M. paleacea*.

The study of the involucre is beset with considerable difficulty on account of its extreme delicacy. This has apparently been the cause of considerable confusion in the published descriptions. In *M. domingensis*, for example, the involucre is said to be laciniate-ciliate or shortly fimbriate; in *M. inflexa*, laciniate; in *M. disjuncta*, sparingly dentate or subentire; in *M. caracensis*, shortly fimbriate. Fig. 12, E-J, brings out the range of variation.
observed by the writer. The nearest approach to an entire condition is seen in Fig. 12, E, although even here the margin is distinctly and closely crenulate; in Fig. 12, F, the crenulate condition is more pronounced, some of the teeth being two cells long; in Fig. 12, G, a crenulate portion directly adjoins a short-ciliate portion, in which the cilia are two or three cells long; in Fig.

![Fig. 12. Marchantia domingensis Lehm. & Lindenb.](image)


12, H-J, taken from a single receptacle, the variation to be expected is shown with especial clearness, some of the marginal teeth or cilia being straight and some curved. In all probability the laciniate and fimbriate involucres of the descriptions have been the result of irregular tears in old material.

In the case of the male receptacle, Sullivant states that the number of lobes in *M. disjuncta* is normally seven, although some
of his figures show six, four, or only three lobes. Stephani places the number at about eight in his account of *M. disjuncta* but makes no mention of the male receptacles in *M. domingensis, M. Elliottii* or *M. caracensis*. Apparently a good deal of variation is to be expected from varying environmental conditions, as Goebel\(^2\) has recently noted, poorly developed material showing a reduced number of lobes. Even when only two rays are present the upper part of the stalk shows two rhizoid-furrows, although the lower part shows but one. The deeply lobed male receptacle will distinguish *M. domingensis* from all the preceding species except *M. breviloba*. In addition to its greater size this species differs from *M. domingensis* in the appendages of the ventral scales, which are larger and much less toothed; in the slime cells of the thallus, these structures being apparently never found in *M. domingensis*; in the less deeply lobed female receptacles; and in the distinctly ciliate involucres.

7. *Marchantia papillata* Raddi


*Marchantia androgyna* Nees; Martius, Fl. Brasil. 1: 308. 1833.

Not L.


Thallus dull green, not glaucous, sometimes more or less pigmented with purple, usually 1.5-3 mm. wide and 0.8-1.15 cm. long, dichotomous, the forks usually only 1.5-3 mm. apart, texture firm, margin entire; epidermis composed of cells with more or less thickened walls, usually in a single layer, mostly 20-50µ long (averaging about 30µ) and 12-20µ wide (averaging about 15µ), papillae absent; pores (with their surrounding cells) mostly 50-70µ long and 40-45µ wide, surrounded usually by five (or six) rows of cells (two or three in the upper series and three in the lower series), each row usually composed of four cells (rarely of three or five), the lowest row of the upper series sometimes with from five to eight cells, inner opening usually four-sided (rarely with three or five sides), the sides concave,  

\(^2\) Organographie der Pflanzen, 2d ed. 699. 1915.
bounding cells more or less obscured by a resinous deposit; air-chambers low, isodiametric or somewhat elongated, their outlines very indistinct when viewed through the epidermis, present everywhere, rows of photosynthetic cells usually two or three cells long; compact ventral tissue about fifteen cells thick in the median portion; the walls sometimes pigmented, more or less thickened and showing distinct pits, sclerotic cells scattered, mostly fifteen to twenty in a cross-section, more abundant in the median portion but often present in the wings, sometimes clearly visible without sectioning, slime cells lacking; ventral scales in two rows, the row of laminar scales more or less irregular but tending to alternate with the median scales and not much nearer the margin; appendages of the median scales ovate, when well developed mostly 0.3-0.45 mm. long and 0.25-0.3 mm. wide but sometimes considerably smaller, apex apiculate, acute, or cuspidate, margin subentire or usually more or less closely denticulate or dentate, the teeth irregular, mostly one or two cells long, rarely larger and more lobe-like, cells showing a gradual and slight decrease in size toward the margin, median cells usually longer than broad, mostly 40-60 μ long and 25-30 μ wide, marginal cells mostly 30-45 μ long and 15-25 μ wide, irregular but usually with the long axis at right angles or nearly so to the margin, cells containing oil-bodies apparently always lacking, male receptacle borne on a stalk about 3 mm. long with two rhizoid-furrows, the disc about 0.8 cm. wide, deeply four- to eight-lobed, the lobes or rays palmately disposed (the basal sinus being very broad), about 3 mm. long and 1 mm. wide, rounded at the apex and with a thin wavy margin, ventral scales imbricated: female receptacle borne on a stalk 1.5-2 cm. long, with two rhizoid-furrows and a single broad dorsal band of air-chambers, the disc mostly 3-4 mm. broad, normally nine-lobed (but sometimes with five to eight lobes), the lobes or rays 1-1.5 mm. long and about 1 mm. wide, distinctly dilated at the truncate to emarginate apex, strongly convex on upper surface, basal sinus broader than the others, upper surface of disc with a low median protuberance; involucre very delicate, irregularly lobed and crispate, otherwise entire or slightly and irregularly crenulate; pores yellowish brown, about 26 μ in diameter, outer face bearing a series of very low ridges not forming a network, margin narrow and often indistinct, less than 2 μ broad; elaters about 8 μ broad, bispiral: cupules sparingly and irregularly denticulate to short-ciliate, the teeth being projections of marginal cells or from one to four cells long, epidermal papillae lacking. (Fig. 13.)

The following specimens have been examined:

Brazil: Rio de Janeiro, without date, G. Raddi (N. Y., type); without date, J. Milne (N. Y.); without definite locality or date, W. J. Burchell 1857 (N. Y.).

PERU: near the Rio Huallaga, R. Spruce (type of M. subandina, distributed in Hepaticae Spruceanae).

BOLIVIA: Isapuri, October, 1901, R. S. Williams 2145 (N. Y., Y.).

Although the writer has seen no specimens of M. papillata from other localities, the following records may be cited from the literature:


MARTINIQUE: without definite locality or collector's name (listed by Underwood in Bot. Gaz. 20: 70. 1895); without definite locality or date, A. Plée 1821 (listed by Bescherelle in Jour. de Bot. 7: 193. 1893).


FALKLAND ISLANDS: without definite locality or date, C. Gaudichaud (listed, as M. platycnemos, in Freyc. Voy. Bot. 218. 1827).

The original M. papillata included two varieties, a. brasiliensis and β. italica. Nees von Esenbeck soon showed, however, that the second variety was a synonym of M. paleacea; he therefore reserved the name M. papillata for the first variety, a course which has been followed by subsequent writers. He was also the first to recognize the fact that his Brazilian M. androgyna belonged to M. papillata and to include M. platycnemos among the synonyms of the same species. It is possible, however, that M. platycnemos ought still to be maintained as a species, at least in part. It was based on three specimens, the first from the

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Marianne Islands in the Pacific, the second from the Falkland Islands, and the third from Brazil. The first specimen may be regarded as the type of the species since it is mentioned first. A portion of this specimen in the herbarium of the New York Botanical Garden shows that the type is distinct from *M. papillata*, as here understood, but that it is very close to *M. emarginata* and perhaps synonymous with it. Nees von Esenbeck’s inclusion of *M. platycnemos* among the synonyms of *M. papillata* must therefore be considered as applying to a part only of Schwaegrichen’s species as originally described.

Of Raddi’s original figures, f. 3 is said to represent male plants and f. 4, female plants. This is obviously an error, the receptacles shown under f. 3 being clearly female. In f. 3a six receptacles are drawn, two showing six lobes apiece and one seven lobes, the number being doubtful in the other three. In f. 3b an enlarged receptacle with nine lobes is represented; the lobes show clearly the enlarged apices with more or less distinct emarginations, and no difference is brought out between the basal sinus and the others. The receptacles shown in f. 4 are very doubtful and bear a disc which is scarcely lobed at all. Unless drawn from very immature material they probably belong to some other species than *M. papillata*. It should be noted, however, that the Synopsis describes the disc of the male receptacle as “subdimidiato excentrico marginibus repando-lobatis,” thus evidently recognizing a male receptacle in Raddi’s so-called female receptacle; but Stephani apparently discards this view, since he does not mention the male receptacles at all.

The specimen of *M. papillata*, quoted above as the type, is in the Mitten herbarium and was received from Hooker. It is very fragmentary but includes three female receptacles, two showing eight lobes apiece and the third, seven lobes. The dilated apices of the lobes and the broader basal sinus are clearly apparent. This specimen has been carefully compared with the other specimens cited and found to agree with them in all essential respects. Spruce compares *M. subandina* with both *M. papillata* and *M. Berteroana*, which he knew from description only. He ascribes to the species, however, a polyoicous inflorescence and monospiral elaters. Unfortunately the specimens which he distributed, although agreeing with his description in other respects, show a strictly dioicous inflorescence and bispiral...
elaters, so that his statements about the inflorescence and elaters must have been based on a misconception. The thallus of *Marchantia papillata* is even smaller than in *M. domingensis*; it is, in fact, the smallest American species known at the present time. So far as the structure of the thallus is concerned the agreement with *M. domingensis* is very close. Slime cells seem to be always lacking in both species and sclerotic cells are usually abundant and equally conspicuous. The appendages of the median scales, moreover, are essentially the same, although the marginal teeth in *Marchantia papillata* exhibit a slightly wider range.
of variability. There are, however, certain differences in the epidermal cells and pores which deserve some emphasis. The cells and pores are not only distinctly smaller than in *M. domingensis*, but the pores are constructed on a simpler plan, the opening being surrounded by fewer rows of cells and the number of cells in each row being less subject to variation. The cells bounding the inner opening tend to be more convex. It must be admitted that these differences are very slight and might not deserve much attention if they were not supported by other differences derived from the female receptacle.

The variability of the receptacles with respect to the number of lobes has already been commented upon in connection with the type specimen and becomes still more apparent from a study of the published descriptions. According to Nees von Essenbeck the usual number of lobes is seven, eight to ten being sometimes present; according to Spruce nine lobes are present in *M. subandina*; according to Schiiffner, who studied Raddi's specimen in the Lindenberg herbarium, the normal number of lobes in *M. papillata* is six, a larger number being unusual; according to Stephani both *M. papillata* and *M. subandina* have nine lobes apiece. In the writer's opinion nine may be regarded as the normal number of lobes, although a smaller number frequently occurs. In the number of lobes, therefore, the species agrees on the whole with *M. domingensis*. The receptacle, however, is smaller; the lobes are more dilated and more frequently emarginate at the apex; the medium protuberance of the disc and the convexity of the lobes are more pronounced; and the involucre is less variable, being entire or nearly so and apparently never bearing elongated teeth or cilia. Just how constant these differences are can only be established by the study of more material. If they should be found to intergrade it might become necessary to reduce *M. domingensis* to synonymy under *M. papillata*, but the differences seem sufficient at the present time to justify the maintenance of both species as valid.

The group of species to which *M. domingensis* and *M. papillata* belong is well represented in paleotropic regions. Among the species which are referable to this group *M. emarginata* R. Bl. & N., *M. linearis* Lehm. & Lindenb., and *M. Schaden-

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American Species of Marchantia.

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55 Lehmann, Pug. Plant. 4: 8. 1832.
bergii Steph. may be especially mentioned. The first of these has a very extensive distribution and is reported by Stephani from China, the Himalayas, Japan, Java and the Philippine Islands; the second is known from various parts of India; the third, from the Philippine Islands only. These three species are closely related, and the differences brought out by Stephani are not very convincing. As indicated in the synonymy the authors of the Synopsis referred specimens of *M. domingensis* to *M. linearis* it will be sufficient to compare the two American plants with this latter species, a full description of which has been published by Schiffner.

In size *M. emarginata* is comparable with *M. domingensis*; in the structure of the female receptacle, with *M. papillata*. It agrees with both species in the possession of sclerotic cells in the thallus; in the general features of the ventral scales; in the closely toothed appendages of the median scales; and in the structure of the involucre. Schiffner describes the latter as lobed and almost entire, but it is sometimes possible to detect a few short teeth, especially toward the outer extremities. A few differences in the structure of the thallus may be mentioned. In *M. emarginata*, for example, although sclerotic cells are present they are never so abundant or so conspicuous as they sometimes are in *M. domingensis*. The thallus is further distinguished by the possession of slime cells and, according to Schiffner, by the occasional presence of epidermal papillae. It would be unwise, however, to lay much stress on any of these differences, since the structures on which they are based are so very variable.

The female receptacle of *M. emarginata* shows the features described under *M. papillata* in an intensified form. The median protuberance is not only more pronounced, but the lobes themselves might almost be described as costate, while their apices are more markedly dilated and emarginate. These features are of course subject to variation. The male receptacles are distinguished by their long and slender stalks. The cupules are much the same as in two American species.

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27 Fl. de Buitenzorg 4: 31. 1900.
8. **Marchantia Bescherellei** Steph.


Thallus dull green, not glaucous, slightly or not at all pigmented with purple, mostly 5-7 mm. wide and 2-3 cm. long, dichotomous, the forks 1-1.5 cm. apart, texture very delicate, margin entire, sometimes vaguely and irregularly plicate; epidermis composed of cells with very thin walls, in a single layer, mostly 40-70μ long (averaging about 50μ) and 20-35μ wide (averaging about 25μ), papillae absent; pores (with their surrounding cells) mostly 160-200μ long and 120-160μ wide, surrounded usually by seven or eight rows of cells, three or four in the upper series and four in the lower series, the two lower rows of the upper series usually composed of ten to twelve or even more cells apiece, the other rows of five or six cells, rarely of only four cells apiece, inner opening usually five- or six-sided, rarely only four-sided, with the sides strongly concave, resinous deposit slight; air-chambers low, somewhat elongated, their boundaries indistinct when viewed through the epidermis, present everywhere except close to the margin, rows of photosynthetic cells usually two or three cells long; compact ventral tissue mostly twelve to fifteen cells thick in the median portion, abruptly thinning out in the wings, the walls somewhat pigmented, slightly or not at all thickened, sclerotic cells scattered, sparingly developed, slime cells lacking; ventral scales in two rows, the laminar scales alternating with the median scales and not much nearer the margin; appendages of the median scales ovate, when well developed mostly 0.5-0.6 mm. long and 0.35-0.45 mm. wide but often smaller, apex acute, margin sparingly and irregularly dentate, the teeth in the basal portion often larger and sharper and sometimes lobe-like, cells showing a gradual and slight decrease in size toward the margin, median cells usually longer than broad, mostly 50-80μ long and 30-40μ wide, marginal cells mostly 30-50μ long and 15-25μ wide, irregular but usually perpendicular or nearly so to the margin, cells containing oil-bodies lacking; male receptacle borne on a stalk about 1 cm. long (in the only example studied), with two rhizoid-furrows and (apparently) with a single broad dorsal band of air-chambers, the disc 7 mm. broad, with four short and rounded lobes or rays with thin margins, basal sinus more than 180 degrees, the other sinuses narrow, ventral scales apparently in two rows: female receptacle borne on a stalk about 2 cm. long (in the only example studied), with two rhizoid-furrows and dorsal air-chambers apparently in two distinct bands, the disc about 7 mm. wide, with five short and rounded lobes or rays, upper surface of receptacle plane, basal sinus a straight line or nearly so; involucre delicate, closely and irregularly dentate, some of the teeth three or four cells long and two to four cells wide at the base, other
teeth smaller: spores (according to Stephani) yellowish brown, 23μ in diameter, erose along the ridges, otherwise smooth. (Fig. 14.)

Known only from the following specimens:


The material of M. Bescherellei in the Boissier herbarium, portions of which have been examined by the writer, includes the female type specimens and the male specimens collected by Ule. A sterile specimen of the type material, in the Mitten herbarium, has likewise been examined. It will be noted that Spruce,28 who published a list of Glaziou's specimens, makes no mention of No. 6348. According to the label on the specimen in the Mitten herbarium, Spruce thought that this number might perhaps represent a new genus of the Marchantiaceae, but he evidently reached no definite conclusion about it. Probably he had only sterile material at his disposal, because the female receptacle shows at once that Stephani was correct in referring the plant to the genus Marchantia. Unfortunately the specimens studied by the writer were very fragmentary and remained shriveled after long soaking in water. It was therefore impossible to gain from them an adequate idea of the species, and some of the statements made about the structure must be regarded as more or less tentative.

The texture of M. Bescherellei is exceedingly delicate and the thallus thins out abruptly in passing from the midrib to the wings. In the latter the ventral tissue becomes reduced, according to Štephi, to a single cell in thickness, and the marginal portion, where the entire thallus is only one cell thick, is four cells broad. Although the air-chambers are low the photosynthetic tissue is well developed and characteristic and the pores are large and complex.

The appendages of the ventral scales are composed of cells which show a gradual decrease in size in passing from the median portion toward the margin, resembling in this respect the appendages of M. domingensis and M. papillata, but the margin itself is

very different in being much more sparingly toothed. Among the preceding species the appendages find their closest counterparts in *M. paleacea* and *M. breviloaba*. Their apices, however, are more uniformly sharp-pointed, their teeth tend to be sharper, and their marginal cells are more frequently placed at right angles to the margin.

With regard to the female receptacle there are marked discrepancies between Stephani's original description and the later description of his Species Hepaticarum. According to the original account the disc is green, convex in the middle, five-lobed for one third the distance from margin to center, the lobes being rounded and shortly incised at the apex, plane and horizontal, delicate and beautifully reticulated. Doubt is thrown, however, upon the constancy of the five-lobed condition. The involucres are described as reddish, firm in texture, and shortly ciliate. According to the later account the disc is brownish green, delicate and veiny, plano-convex in the center, and nine-lobed, the lobes being plane, connate almost to the apex, rounded and very shortly incised. The involucre is said to be hyaline, small-lobed, irregularly and shortly fimbriate. In the only receptacle seen by the writer the disc is five-lobed, the two basal lobes being only about

![Fig. 14. Marchantia Beschelrei Steph.](image-url)

*Fig. 14. Marchantia Beschelrei Steph.*

Anatomical details. A-C. Appendages of ventral scales, x 100. D. Part of an involucre, x 100. Drawn from the type specimen.
half as broad as the other three lobes and the sinus being practically a straight line. The three broad lobes appear to be very shortly incised at the apex but they are actually only emarginate, the apparent incision being really filled by an extension of the membranous margin of the lobes. In other respects the lobes agree with Stephani’s accounts. The involucre is distinctly toothed, but the teeth are scarcely long enough or sharp enough to be described as cilia or fimbriations. The discrepancy in the number of lobes which Stephani’s accounts bring out might of course be due to a variability of the species, which could only become evident through the study of more extensive material.

It is unfortunate that the structure of the stalks of the receptacles must be left in doubt. In Stephani’s original description the stalk of the female receptacle is said to bear two dilated dorsal lamellae but no mention is made of these in his later account, and nothing whatever is said about the structure of the stalk of the male receptacle. From the scanty supply of material available, it has been impracticable to prepare cross-sections of stalks, so that the writer is unable to confirm Stephani’s statement or to add further details. If the stalk of the male receptacle bears a band of air-chambers the relationship might be with *M. domingensis*. If two bands of air-chambers are present in the stalk of the female receptacle, a relationship with *M. chenopoda* would be indicated, and it is worthy of note that Mitten referred Glaziou’s type specimen to *M. brasiliensis* Lehm. & Lindenb., a species which is now included among the synonyms of *M. chenopoda* L. According to our present knowledge, however, the systematic position of the species can hardly be determined.

9. *Marchantia chenopoda* L.

*Marchantia androgyna* L. l. c. 1138. 1753 (in part); Swartz, Fl. Ind. Occ. 1882. 1806.
*Chlamidium indicum* Corda; Opiz, Beitr. zur Naturg. 647. 1828 (nomen nudum).
*Marchantia cartilaginea* Lehm. & Lindenb. l. c. 4:31. 1832.
*Marchantia brasiliensis* Lehm. & Lindenb. l. c. 4:32. 1832.

Thallus pale or yellowish green, sometimes more or less glaucous, usually tinged with purple or brownish on the lower surface, usually 4-7 mm. wide and 2-3 cm. long, dichotomous, the successive forks averaging about 1 cm. apart, texture varying from firm and often leathery to delicate, margin entire; epidermis composed of cells with slightly thickened walls, often in two layers, mostly 30-60µ long (averaging about 40µ) and 15-30µ wide (averaging about 22µ), papillae absent, slime cells often present, averaging about 60µ in diameter; pores variable in size, usually (with their surrounding cells) measuring 100-170µ in length and 80-130µ in width but sometimes considerably smaller, usually surrounded by seven rows of cells (four in the upper series and three in the lower), more rarely by six, eight or even nine rows, the two upper rows of the upper series and the two lower rows of the lower series composed of four to six cells apiece, the third row of each series usually of twice as many, and the fourth row of the upper series usually of a much larger number, sometimes of as many as eighteen, inner opening four- to six-sided with the sides straight or more or less concave, cell-walls mostly smooth throughout; air-chambers of medium height, isodiametric or somewhat elongated, their boundaries usually distinct but sometimes obscure when viewed through the epidermis, present everywhere, cells of partition walls sometimes including slime cells, rows of photosynthetic cells usually three or four cells long; compact ventral tissue mostly twenty to twenty-five cells thick in the median portion, the walls sometimes pigmented, more or less thickened and showing distinct pits, sclerotic cells usually distinct, scattered, mostly twenty to fifty in a cross-section, usually abundant in both median portion and wings, slime cells usually present, scattered, tending to be more abundant in the wings, rarely more than six or eight in a cross-section; ventral scales in two distinct rows, the laminar scales alternating with the median scales and not much nearer the margin; appendages of the median scales very variable, lanceolate to broadly ovate, when well developed mostly 0.45-0.65 mm. long and 0.3-0.4 mm. wide but sometimes considerably smaller, apex acuminate, acute or apiculate, margin entire or variously and irregularly toothed, the teeth rarely numerous and often restricted to the basal portion, cells of about the same size throughout or showing a slight and gradual decrease in size toward the margin, median cells usually longer than broad, mostly 60-90µ long and 25-40µ wide, marginal cells mostly 30-70µ
long and 20-35μ wide, irregular, the long axis varying from parallel to perpendicular to the margin, cells containing oil-bodies usually absent, rarely one or two present: male receptacle borne on a stalk mostly 1-2 cm. long, with two rhizoid-furrows and no air-chambers, the disc mostly 0.8-1 cm. broad, deeply lobed, the lobes or rays mostly four, rarely five or six, palmately disposed, the basal sinus sometimes more than 180 degrees broad, the lobes mostly 5-7 mm. long and 1.5-2 mm. wide, rounded, with a thin wavy margin extending across the basal sinus, ventral scales imbricated, mostly in two rows: female receptacle borne on a stalk 2-4 cm. high, with two rhizoid-furrows and two narrow dorsal bands of air-chambers, the disc convex, mostly 6-8 mm. wide, shortly five-lobed, the lobes or rays convex, rounded and separated by shallow sinuses, the basal sinus much broader than the others and approximating a straight line: involucre firm, the margin sparingly dentate to closely ciliate or laciniate, the teeth or cilia varying from one to five cells in length, sometimes forking; spores brownish yellow, about 26μ in diameter, narrowly margined, the outer face bearing a few low ridges not forming a network; elaters about 6μ wide, bispiral: cupules closely short-ciliate, the cilia mostly two to four cells long, outer surface without papillae. (Figs. 15-20.)

A widely distributed species is tropical America. The following specimens have been examined:

**Puebla:** banks of Avenida Hidalgo and path to barranca, Tezuitlan, October, 1908, *Barnes & Land* 537.

**Vera Cruz:** Jalapa and vicinity, September, 1906, *Barnes & Land*, no number (Y.); July, 1908, C. G. Pringle 15326 (Y., distributed in Pl. Mex. under a manuscript name of Stephani); November, 1908, *Barnes & Land* 556, 614, 626a (Y.); vicinity of Orizaba, November, 1908, *Barnes & Land* 631, 670 (Y.).

**Guatemala:** without definite locality or date, *Godman & Sabin* (N. Y.); Santa Rosa, September, 1894, *Heyde & Lux* 6203 (N. Y.); near the Finca Sepacuité, Alta Verapaz, March and April, 1902, *Cook & Griggs* 83, 141, 394 (U. S., Y.); trail from Pangós to Sepacuité, Alta Verapaz, January, 1908, *Maxon & Hay* 3111 (U. S., Y.); Coban, Alta Verapaz, *H. von Tuerckheim* 6074 (N. Y.).

**Costa Rica:** Bagnar, Angostura, June, 1874, O. Kuntze 2102 (N. Y.); la Verbena, Alajuelita, August, 1894, *A. Tonduz* 15562 (N. Y., Y., distributed by E. Levier under a manuscript name of Stephani); Rio Turrialba, March, 1896, *J. D. Smith* (N. Y.); Cuesta de la Vieja, road to San Carbos, April, 1903,
American Species of Marchantia.

Cook & Doyle 111 (U. S., Y.); Juan Vinas, April, 1903, Cook & Doyle 301 (U. S., Y.); vicinity of La Palma, May, 1906, W. R. Maxon 489 (U. S., Y.).

Panama: without definite locality or date, B. Seemann (N. Y.); Darien, April and June, 1908, R. S. Williams 1083, 1084 (N. Y., Y.).

Cuba: without definite localities or dates, C. Wright (distributed in Hep. Cubenses).

Jamaica: without definite localities or dates, Fordyce, W. Wright; Whitfield Hall, December, 1896, W. Harris 11063 in part (N. Y.); Moody's Gap, March, 1895, W. Harris 5671 (N. Y., U. S., Y.); vicinity of Cinchona, November, 1902, F. S. Earle 397a (N. Y., Y.); July, 1903, A. W. Evans 248 (Y.); Mount Airy, trail to Tweedside, April, 1903, W. R. Maxon 864 (U. S., Y.); Second Breakfast Spring, near Tweedside, April, 1903, W. R. Maxon 880 (U. S., Y.); Morce's Gap, August, 1906, A. W. Evans 405 (Y.); Cuna Cuna Gap, September, 1908, E. G. Britton 900 (N. Y., Y.); March, 1909, Britton & Howe 4032 (N. Y., Y.).


Guadeloupe: without definite locality, 1874, T. Husnot (distributed in Pl. des Antilles 196); Gombeyre, 1897-1900, Père Duss 391 (N. Y.); Basse Terre, 1898 Père Duss 253 (N. Y., determined as M. brasiliensis by Stephani).
Martinique: St. Pierre, 1899-1900, Père Duss 390 (N. Y.,

![Diagram of Marchantia chenopoda](image)

**Fig. 15. Marchantia chenopoda L.**


determined as *M. brasiliensis* by Stephani); Carbet, 1899, *Père Duss* 342 bis (N. Y.); Morne Rouge, August, 1901, *Père Duss* 581 (N. Y.).
Grenada: Grand Etang, 1913, R. Thaxter (H., Y.).


Colombia: Andes Bogotenses, W. Weir (N. Y.).

Brazil: Orgaos Mountains, C. Gaudichaud (N. Y., specimen from the Montagne herbarium, labeled simply "Brasilia," presumably the basis for the record in Voy. Corv. la Bonité, Bot. 1: 209. 1844-46); Morro Velho, no date, G. Gardner 131 (N. Y.); Rio de Janeiro, no date, J. Milne (N. Y.); A. Glaziou 17992 (N. Y., listed by Spruce in Rev. Bryol. 20: 60. 1893); Jacobina, Mattogrosso, October, 1872, O. Kuntze (N. Y., sterile and somewhat doubtful); near Sao Paulo, April, 1905, A. Usteri i 1 (Y.).


Bolivia: near Irupana, A. d'Orbigny 226 (M., type of Grimaldia peruviana); Yungas, 1885, H. H. Rusby, 3001, 3002, 3003, 3004 (N. Y., U. S., listed by Spruce in Mem. Torrey Club 1: 140. 1890); 1892, M. Bang 1545 (N. Y.); July, 1893, P. Jay 71 (N. Y., Y.); Tumupasa, December, 1901, R. S. Williams 2143 (N. Y., Y.).

Galapagos Islands: Albamare Island, August, 1906, A. Stewart 6876.

The following additional stations, recorded in the literature, are likewise of interest:

Oaxaca: Mirador and Comaltepec, F. Liebmann (listed by Gottsche in Mex. Leverm. 268. 1863).

Vera Cruz: near Orizaba and at Cordoba, 1855, F. Muller (listed by Gottsche, l. c.).


Jamaica: without definite locality or date, P. Collinson (type of M. Dillenii).
Martinique: Morne de la Calabassee, without date or collector's name (type, cited by Plumier); without definite locality, date, or collector's name (type of M. cartilaginea); without definite locality or date, Hahn 1347; T. Husnot 197, 198 (the last three listed by Bescherelle in Jour. de Bot. 7: 193. 1893).


Peru: Rio Huallaga, November, 1902, E. Ule 527 (listed by Stephani in Hedwigia 44: 223. 1905).

Brazil: "Montagne d'Estrella," G. Raddi (cited by Raddi, see below); without definite locality or date, F. Sellox (type of M. brasiliensis).

The specimens recorded by Schiffner from the Fiji Islands (Lebem. Forschungsr. S. M. S. "Gazelle" 43. 1890) are described as having ciliate-dentate ventral scales and would probably now be referred to some other species.

The interpretation of M. chenopoda is beset with difficulties, and a history of the species may therefore be in place. The Linnaean description or diagnosis is very short and reads, "Marchantia calyce communidimidiato palmato quadrifido." If the term "calyx" signifies the female receptacle this description would not apply accurately to any of the known American species, where a four-parted receptacle occurs only as an abnormality. If the term signifies the male receptacle there are several species to which the description might perhaps apply. In any case it would be quite impossible to identify a definite species by means of the Linnaean description alone.

Unfortunately the only synonym which Linnaeus quotes, the "Lichen anapodocarpos" of Plumier, is likewise insufficient to lead to a positive conclusion. Plumier39 described his plant from material collected on the Morne de la Calabasse in Martinique. Linnaeus cites the original description and figure and also the

later description and figure published by Dillenius. Plumier's figure represents certain reproductive parts in detail and a thallus with a sinuate or vaguely lobed margin, branching occasionally by forking and apparently also by ventral outgrowths. From the tips of some of the branches the four-lobed receptacles on short stalks take their origin and clearly bring the growth of the branches to an end. In two cases—possibly in three—five-lobed receptacles are shown. In his text Plumier compares the appearance of the plant with that of the Indian fig and says that the upper surface is of a pale green color and roughened by minute elevated points. He compares the entire receptacle with a mushroom and states that one side of the disc is rounded, while the other shows four semicircular lobes, the whole resembling an inverted goose foot. He adds that each lobe opens longitudinally, and shows minute white "flowers" in the form of tubes. Each tube divides at the apex after a while into four parts which roll back and disclose an oval fruit filled with "seeds" like flour. It is clear from this account that he had female receptacles before him and that he saw the involucre, the pseudoperianth, the capsule, and the spores.

Dillenius took his figure directly from Plumier and did not know the plant itself. He tried to improve the figure, however, by indicating that the upper surface of the thallus was covered over with minute polygons as in related species. Lindberg criticises the figure of Dillenius (and consequently that of Plumier) by stating that an autoicous inflorescence is shown, both male and female receptacles being represented on the thallus. This criticism is undeserved. The receptacles shown are all female, the dorsal surface being represented in some cases and the ventral in others. In his text Dillenius brought out the fact that the receptacles were all the same kind, although he incorrectly interpreted the fruit of Plumier as an anther and the flour-like seeds as pollen, a well-known error which he repeats in his interpretation of the reproductive parts in other bryophytes.

On the basis of Plumier's description and figures it becomes evident that the term "calyx" in the Linnaean diagnosis of M.

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*chenopoda* refers to the female receptacle, and it has already been pointed out that a quadrifid female receptacle is not found normally in any known American species. Plumier's work indicates further, that the involucres and sporophytes of his plant are situated underneath the lobes, a condition which is likewise
unknown among American species, where the involucres and sporophytes invariably alternate with the lobes. Since there are apparently no specimens of Plumier's plant in herbaria, it is clear that *M. chenopoda* L. represents an unidentifiable plant, and the logical course would be to give up the species altogether.

In the literature of the Hepaticae, however, *M. chenopoda* has an established place, and it seems justifiable to interpret it according to the descriptions of later writers. Even Plumier's figure gives us a little help because it shows that he occasionally observed a five-lobed receptacle, although he makes no mention of such a structure in his text. Since most subsequent writers ascribe to the species definitely a five-lobed receptacle, and since the species to which they assign the name is abundant in Martinique, it is quite probable that their *M. chenopoda* is the same as Plumier's plant. Unfortunately their descriptions and figures are not without discrepancies, and it becomes evident that Taylor at least did not distinguish between what is here called *M. chenopoda* and *M. domingensis*.

Apparently Swartz\(^42\) was the first to describe the male receptacles. He states that they are subpeltate, unsymmetrical, palmate-quadrifid, plane and verruculose above (like the thallus), and convex below, the rays or lobes being linear, obtuse, and often unequal, with membranous, undulate margins. He cites no stations for the species although he implies that it occurs in Jamaica. Quadrifid receptacles are sometimes found in *M. domingensis*, but it is probable that Swartz had the true *M. chenopoda* before him, and his description is definitely cited in the Synopsis Hepaticarum.

Schwaegrichen,\(^43\) in 1814, quotes *M. chenopoda* from Africa as well as from America, and F. Weber,\(^44\) the following year, notes a similar extension of range. Neither writer adds anything significant to our knowledge of the species, and it is probable that their citation of African stations is based on incorrect determinations, since all subsequent writers restrict the range of *M. chenopoda* to America.

A few years later Raddi\(^45\) extended the known range of the

\(^{42}\) Fl. Ind. Occid. 1880. Erlangen, 1806.


\(^{45}\) Mem. Soc. Ital. Modena 19: 44. 1823; 20: pl. 6a, f. 1, 2. 1829.

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species into Brazil and stated that it occurred abundantly at the bottom of moist and mossy rocks on the "Montagne d'Estrella." According to his account *M. chenopoda* is distinguished from all the other species of *Marchantia* by its receptacles, which are truncate on one side. He adds that in the male receptacle the upper surface is plane and that the four parts or lobes are unequal in length, and he criticises Plumier for comparing this receptacle with a goose's foot; in his opinion it is more like the foot of a pigeon. Of course this criticism has no weight, since Plumier drew his account entirely from female receptacles. According to Raddi the disc of the female receptacle is strongly convex and either entire or very shortly divided, bearing on the lower surface four fleshy or rib-like swellings, between which are borne the capsules, much as in *M. polymorpha*. He notes further that the upper surface of the thallus is areolate and perforated by white vesicles and that the lower surface is violet except along the margin, where it is green. Although Raddi's specimens have not been available for study it is evident that he had the true *M. chenopoda* before him. Not only is his description unusually clear, but the species has since been collected in other Brazilian localities.

In 1835 Taylor published an account of the Marchantiaceae which had come under his observation. In his description of *M. chenopoda* he comments on the inaccuracies of Plumier's figures and quotes them doubtfully, although it was upon Plumier's work that the species was primarily based. According to Taylor the female receptacle is hemispherical and divided into from eight to ten truncate laciniae, each bearing underneath a single involucre with ciliate or serrulate margins. He notes further that the stalk of the receptacle has two rhizoid-furrows and adds interesting statements about the scales on the vegetative thallus and about the cupules. The scales, in his words, have an entire and broadly ovate base, then a deep constriction at about the middle, and then a broadly ovate and ciliate expansion (the latter being what is now known as the appendage). In the cupules he speaks particularly of the serrate margin. It will be seen at once that Taylor's account of the female receptacle is very different from that of his predecessors, and the specimens in his herbarium show that it was drawn from *M. domin-

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46 Trans. Linn. Soc. 17: 379. pl. 12, f. 2. 1835.
American Species of Marchantia.

His account of the male receptacle, however, agrees essentially with that of Swartz. Taylor cites *M. chenopoda* from the Guadeloupe and St. Vincent as well as from Jamaica and Martinique.
In the Synopsis Hepaticarum emphasis is again laid on the receptacles. The female receptacle is said to be excentric, hemispherical, and about five-lobed, the lobes being obtuse, subcrenate and soon obsolete, with hyaline, denticulate involucres. The male receptacles are said to be unsymmetrical and palmately four- to five-parted. This account of the female receptacle agrees closely with that of Raddi and differs from that of Taylor. Both writers, however, are cited under the species. From Brazil several localities are enumerated, but the only West Indian stations given without question are on the island of Martinique. The Synopsis quotes three synonyms: M. androgyna (female plants only), M. Swartzii, and Chlamidium indicum. These may be considered in order.

Swartz apparently supposed that what he called M. androgyna was the same as M. androgyna L., a species based on two citations, the first from Dillenius and the second from Micheli. According to Swartz, who treats the plant very briefly, M. androgyna is related to Rebulia hemisphaerica (L.) Raddi; he describes the thallus as narrower than in that species and states that the male receptacles are perhaps sessile and that the female receptacles are subentire. Although he cites no actual material it is probable that he drew his description from Jamaican specimens collected by himself, these being definitely referred to by later writers.

Now the Dillenian species quoted by Linnaeus under M. androgyna has been the cause of a great deal of confusion. It was based on two entirely different plants, a fact which was first pointed out by Lehmann and Lindenberg in their discussion of the Asiatic M. linearis Lehm, & Lindenb. They show clearly that the Dillenian f. 3B, which, as they state, is essentially the same as the figure by Micheli, represents Grimaldia dichotoma Raddi, a common species of the Mediterranean region. They show further that the Dillenian f. 3A and f. 3C represent a species of Marchantia, and they suppose that this species is the same as the M. androgyna of Swartz. The two figures in question were drawn from specimens collected in Jamaica by P. Collinson;

47 Sp. Plant. 1138. 1753.
48 Hist. Musc. 520. pl. 75, f. 3. 1741.
f. 3A shows a plant with numerous cupules and female receptacles, while f. 3C shows a small forking fragment with cupules only. The receptacles are so strongly convex that they appear conical and resemble those of Conocephalum conicum (L.) Dumort. In fact, according to Lehmann and Lindenberg, the

**Fig. 18. Marchantia chenopoda L.**

M. androgyna of Weber is actually Conocephalum conicum, and the Linnaean name has been applied by other writers to such distinct species as Preissia quadrata (Scop.) Corda and Rehoulia hemisphaerica (L.) Raddi.

Lehmann and Lindenberg's conception of M. androgyna Sw. was based on specimens collected by Swartz in Jamaica. Although they considered these specimens identical with those collected by Collinson they did not take up the name M. androgyna for the species, probably because the original M. androgyna L. was an aggregate. They described it instead under the new name M. Swartsii. The female receptacle, according to their account, is unsymmetrical, hemispherical, and subentire or obsoletely lobed, the lower surface and the stalk being villous. They state further that the upper surface of the thallus is green with many large pores bordered with white, and that the lower surface is brown with scales in the median portion; and they suggest that the male receptacles of Swartz's description may have been cupules only. So far as the descriptions go M. Swartzii and, consequently, M. androgyna Sw. do not differ in any essential respects from M. chenopoda, and the authors of the Synopsis are probably correct in citing these two species as synonyms of M. chenopoda. This view is supported by a fragmentary specimen in the Taylor herbarium, labeled M. Szvartzii by Lehmann, which apparently represents M. chenopoda, although a positive conclusion can hardly be reached without sectioning the material.

A further difficulty in disentangling the synonymy is, however, encountered. Although Lehmann and Lindenberg considered Swartz's and Collinson's plants identical, this opinion was not shared by the authors of the Synopsis Hepaticarum. In quoting M. Swartzii as a synonym of M. chenopoda they take pains to exclude the Dillenian f. 3 altogether, although f. 3A and f. 3C are definitely quoted by the authors of M. Swartzii in citing M. androgyna Sw. as a synonym of their species. Fortunately Collinson's material is preserved in the Dillenian herbarium and throws a little light on the subject. It was studied by Lindberg, who reached the conclusion that it represented a distinct and undescribed species. This he proposed as new under the name M. Dillenii Lindb. He assigns to

the species a delicate pellucid thallus with indistinct areolae but with large pores, the thallus in *M. chenopoda* being thick and opaque with distinct areolae and small pores. He states further that the female receptacles are depressed-semiglobose, excentric and almost entire, the five lobes present being very short, thick,
semicircular in outline and slightly incurved. The receptacles described are immature and do not therefore yield very satisfactory characters, but Lindberg's description, so far as it goes, would clearly apply to *M. chenopoda*. Even the characters drawn from the thallus easily come within the range of variation to be expected in so multiform a species, where both the texture and the size of the pores differ widely in different plants. The writer would therefore follow Stephani in reducing *M. Dillenii* to synonymy, even in the absence of Lindberg's type material.

The third synonym given in the Synopsis, *Chlamidium indicum*, is nothing but a *nomen nudum*. According to Corda it was based on No. 375 of Sieber's Flora Martinicensis. The Synopsis, however, in citing it as a synonym under *M. chenopoda*, states that it was based on No. 378. In the Mitten herbarium a specimen of No. 378 is preserved under the name *M. martinicensis*. This plant, which probably represents the type of the manuscript species *M. martinicensis* Spreng., is clearly referable to *M. dominicensis*, as the authors of the Synopsis have already shown. Their citation of No. 378 under *Chlamidium indicum*, therefore, was probably an error or due to the fact that this number was a mixture; in any case Corda's species, in the absence of adequate publication, deserves no further attention.

If the work of Taylor is excepted it will be seen that writers up to the time of the Synopsis Hepaticarum (1847) were practically unanimous in assigning to *M. chenopoda* a subentire or shortly five-lobed female receptacle and a deeply four-cleft male receptacle. The same thing may be said of subsequent writers. Unfortunately identical or similar characters have been assigned to other species. Aside from *M. Dillenii*, which has already been alluded to, *M. cartilaginea*, *M. brasiliensis*, and *M. peruviana* may be mentioned in this connection. The first was based on material collected on the island of St. Vincent, no collector being named; the second on Brazilian material collected by Sellow; the third on Bolivian material collected by D'Orbigny.

In *M. cartilaginea* the male receptacles are said by the authors of the species to be slightly convex and borne on very short stalks, while the female receptacles are said to be minute and entire or obsolete ly crenulate. Schiffner, who studied the type material, found that the female receptacles were immature and that the so-called male receptacles were nothing more than
extremely young female receptacles. The distinctive characters of the species thus break down, and he reduced it to synonymy, retaining it as a var. cartilaginea (Lehm. & Lindenb.) Schiffn. under *M. chenopoda*. Stephani quotes it as a simple synonym. Their views are supported by the work of Prescher, who found the distribution of the slime cells the same in *M. cartilaginea* as in *M. chenopoda*.

In *M. brasiliensis* the male receptacle is described as peltate, angled and convex, the central portion being thickened and the margin plane and hyaline; the female receptacle is said to be hemispherical, symmetrical and entire. Here again Schiffner showed that the receptacles in the type specimen were immature and that the distinctive characters drawn from the male receptacles could be duplicated by young male receptacles of *M. chenopoda*. He therefore regards *M. brasiliensis* as synonymous with *M. chenopoda*, a view which the writer is disposed to share. Stephani, in maintaining the validity of the Brazilian plant, dwells on the symmetry of the female receptacle and describes it as strongly convex and very shortly four- to six-lobed. He adds that the entire appendages of the ventral scales can easily be distinguished from the dentate appendages of *M. chenopoda*. Since, however, he assigns both entire and toothed appendages to *M. chenopoda* in his detailed description of that species, and since the receptacles on some of the West Indian specimens referred by him to *M. brasiliensis* are distinctly unsymmetrical, his differential characters can not be regarded as having much significance.

In the original description of *Grimaldia peruviana* the female receptacle is said to be subglobose and crenate while the male receptacle is said to be discoid and sessile. Apparently on account of the characters of the so-called male receptacles Montagne continued to regard the species as a *Grimaldia* even after the authors of the Synopsis had correctly transferred it to *Marchantia*. \(^52\) Probably the sessile structures which Montagne observed were immature female receptacles, but unfortunately the type specimen in his herbarium, a portion of which the writer has been able to examine, is sterile, so that these problematical organs could not be studied. The compound pores, however,

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\(^{52}\) See Montagne, *Sylloge* 91. Paris, 1856.
and the cupules show conclusively that the species is a *Marchantia*, and the writer would go even further than Stephani did and reduce it to a synonym of *M. chenopoda*. This conclusion is strengthened by the fact that numerous specimens of *M. chenopoda* have been collected in Bolivia by subsequent explorers.

Although a wide range of variability is assigned to *M. chenopoda*, according to the writer's conception of the species, an equally wide range is assigned to *M. domingensis* and an even wider range to *M. polymorpha*. The structures which are perhaps most subject to variation are the epidermal pores, the slime cells, the appendages of the ventral scales and the involucres. The male receptacles and the female receptacles in most respects exhibit features of a more constant character.

In normal and well-developed specimens the pores are unusually large in the middle of the thallus and are only slightly smaller near the margin. In other cases the contrast in size between the median and marginal pores is much more marked; in still other cases even the median pores may be small or medium sized. Corresponding with these differences in size there are differences in the number of cells in the concentric rows around the opening, although the number of such rows is usually seven. The differences in number are found especially in the third and fourth rows of the upper series and in the third row of the inner series. In the fourth row of the outer series the variation is especially great. In small pores as few as four cells may be present, in large pores as many as eighteen cells, and all gradations between these extremes are to be expected. In the third row of each series similar but less marked differences are encountered. In the first and second row of each series four cells are normally present although three, five, six, or even seven cells sometimes occur.

The slime cells vary greatly in number and in distribution. In typical West Indian material they occur abundantly in the epidermis, in the walls of the air-chambers, and in the compact ventral tissue of the thallus. In other specimens they are rare in the epidermis or even absent altogether, although still persistent in the walls of the air-chamber and in the compact tissue; in still other specimens, and this seems to be especially true of material from Mexico, Central America and South America, they are restricted to the compact tissue, where indeed they may be
Fig. 20. Marchantia chenopoda L.

Anatomical details. A. Cells from compact ventral tissue in cross-section, including two sclerotic cells and a cell containing oil-bodies, x 100. B. Cells from same tissue in longitudinal section, including a sclerotic cell, x 100. C-E. Cells from basal portions of median scales, x 100. F. Stalk of male receptacle, cross-section, x 50. G-I. Stalks of female receptacles, cross-sections, x 50: G, showing a stalk of average size; H, a slender stalk near the middle; and I, the same slender stalk near the base. J-M. Portions of involucres: J, x 40; L-M, x 100. A-G, J. Jamaica, A. W. Evans 405, W. R. Maxon 880. H, I. Panama, R. S. Williams 1084. K. Vera Cruz, Barnes & Land 631. L. Costa Rica, Cook & Doyle 301. M. Bolivia, R. S. Williams 2143.
very scarce. Since these different conditions grade into one another, it seems impossible to use them as a basis for the segregation of *M. chenopoda*.

Very striking variations are to be observed in the appendages of the median scales. If the series represented in Figs. 15-19 is examined it will hardly seem possible at first that all can have been taken from a single species. The appendages shown exhibit four more or less distinct types, varying in shape, in the character of the margin, and in the size of the component cells. In the first type, shown by Figs. 15, A-H, and 16, the appendages are narrowly ovate to lanceolate, tapering gradually to an acute or acuminate apex; the margin is either entire or provided with one or more vaguely defined and irregular teeth; and the cells are large, showing no marked differences in size between the median and marginal portions. In the second type, shown in Figs 15, I, and 17, A, the appendages are larger than in the first type and tend to be more acuminate; the margin is more distinctly dentate, although the teeth are still irregular; and the cells are much the same as in the first type, except for the fact that the marginal cells in the basal portion tend to be smaller. In the third type, shown in Fig. 18, A-C, the appendages are broadly ovate and apiculate to abruptly acute; the margin is entire or vaguely and sparingly dentate or crenate toward the base; and the cells are everywhere large, much as in the first type. In the fourth type, shown in Fig. 18, D-J, the appendages have about the same form as in the third type, although they sometimes taper more gradually; but the margin is more irregular, varying from entire to distinctly and rather closely crenate, dentate, or even lobed in the basal portion; and the cells are distinctly smaller, often showing a definite decrease in size between the median and marginal portions. Cells containing oil-bodies are usually absent altogether, but one or two sometimes occur, as shown in Fig. 16, G, H, J. These have not been observed except in the first type of appendage.

Since the various types of appendage are more or less characteristic of definite regions, the first type, for example, being prevalent in the West Indies and the fourth in South America, the writer at first thought that distinct varieties with definite geographical ranges might be distinguished, using the appendicular differences as a basis. It soon became evident, however,
that this was hardly possible. Many instances were noted where
the range of one type overlapped that of another, and a few
cases were observed in which appendages of two distinct types
occurred on an individual thallus (Figs. 15, H, I; 17, A, B).
It was impossible, moreover, to associate the differences in the
appendages with other differences showing any degree of con-
stancy. In the writer’s opinion, therefore, the numerous types of
appendage are to be regarded as a further evidence of the great
variability of the species.

In the case of the involucres there is again great variability,
although the extremes are perhaps less marked than in M. doming-
gen sis. Fig. 20, L, shows an involucre in which the teeth are
scattered, short, and blunt; while in Fig. 20, J, K, M, the
involucres shown bear crowded, long and slender teeth. It will
be noted that some of the teeth are simple while others are more
or less complex. Bifid teeth are especially common and often
show widely divergent divisions. The involucres are firmer than
in M. domingensis, the cell walls being sometimes distinctly
thickened and pigmented with yellowish brown.

In North America the only species with which M. chenopoda
is likely to be confused is M. domingensis. The two species are
of about the same size, the structure of the epidermal pores is
much the same in both, the sclerotic cells in the ventral portion
of the thallus show a similar distribution and the male recep-
tacles are very much alike in general appearance. There are,
however, striking differences which usually make it possible to
distinguish specimens even in the absence of female receptacles.
In M. chenopoda slime cells can almost always be observed in
the thallus and often occur in great abundance; the appendages
of the ventral scales are often entire and are never very closely
toothed; and the stalk of the male receptacle is destitute of air-
chambers. In M. domingensis there are no slime cells in the
thallus; the appendages of the ventral scales are closely toothed;
and the stalk of the male receptacle bears a band of air-chambers.

If female receptacles are present other important differences
may be observed. In M. chenopoda, the stalk bears two bands
of air-chambers; there are normally only five lobes, these being
very short; and the involucre is firm in texture, the margin
varying from dentate to ciliate or laciniate. In M. domingensis
the stalk bears a single band of air-chambers, there are usually
Alexander W. Evans,

more than five lobes, these being more or less elongated; and the involucre is very delicate in texture, the margin varying from crenulate to short-ciliate.

The features which distinguish \textit{M. chenopoda} from \textit{M. domingensis} will distinguish it also from the South American \textit{M. papillata}. Another South American species to which it may be related is \textit{M. Bescherellei}, the appendages and involucres of which might easily come within the range of variability exhibited by \textit{M. chenopoda}. According to our present knowledge, \textit{M. Bescherellei} is a more delicate species with lower air-chambers and thinner ventral tissue. There is no danger of confusing \textit{M. chenopoda} with any of the other species recognized in the present paper.

\textbf{Doubtful Species}

1. \textit{Marchantia squamosa} Raddi; Lehm. \& Lindenb. in Lehmann, Pug. Plant. \textit{4:} 12. 1832 (as to the Brazilian plant).

\textit{Brazil}: without definite locality or date, \textit{Raddi}.

Attention has already been called to this species and to its possible aggregate nature (see p. 261). Stephani's description agrees in most respects with \textit{M. paleacea}, and it is possible that Raddi's specimens would now be referred to that species. If this should prove true it would mark an interesting extension of range.


\textit{West Indies}: without locality, date, or collector's name.

According to the full description given by Nees von Esenbeck this species is probably a form of \textit{M. domingensis}. In any case there seems to be no reason for attempting to maintain it, since the original specimens (according to Stephani) are poorly developed and valueless.


\textit{Chile}: without locality, date, or collector's name.

This species was based on a single very immature specimen and is not represented in the Montagne herbarium. The original description throws little light on its affinities, and Montagne him-
self apparently had no faith in its validity since he does not mention it in his Sylloge (1856). Stephani therefore seems justified in repudiating it altogether.

   Venezuela: Galipan, without date, Moritz 47b (erroneously ascribed by Hampe to Colombia).
   According to the brief original account the species is monoecious, the female receptacles are four-parted, and the male receptacles seven-parted. Although no specimens have been available the writer suspects that M. flabellata may represent a synonym of M. domingensis. Should this be established it would show that Hampe confused the male and female receptacles and incorrectly assigned a monoecious inflorescence to his species. Unfortunately the question must be left in doubt.

   Chile: near Valparaiso, without date, W. Lehmann.
   Although Stephani at first threw doubt on the validity of this species, suggesting that it was probably synonymous with M. chenopoda, he afterwards listed it without question from the Chilean island of Chiloé, citing specimens collected by C. Skottsberg. The original description of M. Notarisii is very full but is justly criticised by Gottsché on account of its many ambiguities. It certainly seems to point to M. chenopoda, and the writer would refer it provisionally to that species. Unfortunately no specimens of M. chenopoda from Chile have been available for study.

Sheffield Scientific School,
Yale University.

54 Bot. Zeit. 16 (Beil.): 28. 1858.
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A Survey
of
Ancient Peruvian Art

BY

PHILIP AINSWORTH MEANS

YALE UNIVERSITY PRESS
NEW HAVEN, CONNECTICUT
1917
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I. INTRODUCTION.

It will be the writer's endeavor to present in this paper a brief review of the various types of art to be found in pre-Columbian Peru. The work is the fruit of some four years' study, two years of that period having been devoted to a systematic collection of data in various places and under the direction of various people. As the main purpose will be to establish a basis for the classification of Peruvian art-objects, the study will be confined to those regions where the form and stratigraphic relations of the various art-types that make up the sequence of cultures have been determined with a reasonable degree of precision. The reader is urged carefully to bear in mind the fact that many of the various types are to be found in regions far removed from those here to be specified. But in those regions which are far from the source of an art-type or culture new environmental and psychological conditions almost inevitably exercise an influence which results in profound modifications of the original type. The writer hopes that this paper will help to link certain of the Peruvian arts or cultures with certain types of objects from such regions as Ecuador, Eastern Bolivia, North-western Argentina and Northern Chile. It may even be possible in time to gather material evidence which will conclusively prove the basic unity of all the more advanced types of art in aboriginal America.

In the writer's opinion it is still too early to attempt, with any likelihood of success, to read or interpret the inner significance of the various designs that we shall study. Attempts of this nature have been made by Berthon, (1911), Joyce, (1913b), Posnansky, (1914), and others, but still it seems to be unavoidable under the present limitations of our information that all speculations of this sort should lack an atmosphere of conclusiveness. In this day, with our present incomplete knowledge of these ancient peoples, we should not attempt to read into their exotic designs a set of significances expressed in terms of our own experience. Rather, the investigator should seek painstakingly to analyze the various component parts of each pre-Columbian art or culture, as well in Brazil, Argentina, Chile, Ecuador, Colombia, Panama, and Middle America as in Peru.
and Bolivia, with a view first to finding out the distribution of each and every element, and ultimately to arriving at some safe and permanently tenable opinion as to the cultural ancestry of each of the cultures that have flourished in the several regions.

The writer also believes that it is time for a serious attempt to be made to construct for the various cultures of pre-Columbian Peruvian art a chronology, supplied with approximate dates, similar to the one already established for the Maya area. In order to arrive at any permanently valuable opinion as to the cultural position and cultural ancestry of these Peruvian art-types, it will be necessary first to know, at least approximately, when and how long they flourished. For many years it has been the fashion for South American archaeologists to look askance at all efforts to construct a chronology. The recent researches of Dr. Uhle, of the late Sir Clements Markham, of Sr. Arturo Posnansky, of the late Dr. Gonzalez de la Rosa and of others have, however, afforded material that seems to justify a formal undertaking of the construction of a date-chronology for the various Peruvian cultures. The author has already made a tentative effort in this direction, and the reception it has met with has encouraged him to pursue the matter further. It is inevitable that discussion of this important matter should finally result in the establishment of a reasonably correct date-chronology. Accordingly, in the hope of bringing that desideratum of Peruvian archaeology nearer, he has ventured to insert at the end of this study a tentative date-chronology of the various art-periods or cultures of early Peru.

The author is greatly indebted to many people for the aid, of various sorts, that they have given him during the preparation of this paper. Chief among these are the following: Dr. Roland B. Dixon, of Harvard University; Dr. Alfred M. Tozzer, of Harvard University; Dr. George F. Eaton, of Yale University; Professor George Grant MacCurdy, of Yale University; Dr. Herbert J. Spinden, of the American Museum of Natural History; Mr. Charles W. Mead, of the American Museum of Natural History; Professor Marshall H. Saville, of the Museum of the American Indian; Mr. Sylvanus Griswold Morley, of the Carnegie Institution; Dr. Aleš Hrdlička, of the United States

1 Means, 1917.
SKETCH MAP OF PERU

Showing the locations of the chief sites mentioned in the body of the paper.
National Museum; Mr. F. W. Hodge, of the Smithsonian Institution; and, Mr. Thomas A. Joyce, of the British Museum. To all these gentlemen the writer wishes to extend his thanks for their help.

Acknowledgments are also due to the authorities of the Peabody Museum, Cambridge, Mass., to those of the Museum of Fine Arts, Boston, and to those of the American Museum of Natural History for permission to figure various objects in their collections. Mr. Guernsey of the Peabody Museum, Cambridge, was so kind as to help the writer in taking some of the pictures that accompany the paper, and Dr. Denman Waldo Ross was so good as to spend a long time discussing the aesthetic side of the designs on several of the textiles here illustrated.
II. THE CULTURE PERIODS OF PERUVIAN ART.

Before proceeding to a detailed analysis or to any endeavor to coördinate the various cultures, it will be best for us to state as briefly as possible what the periods of culture are and where each is found at its highest development. Appendix II shows their chronological position with respect to one another, and the accompanying map shows the location of the chief sites connected with each of the cultures. It remains for us to summarize the outstanding features of the various types.

I. THE PROTO-CHIMU AND PROTO-NASCA CULTURES.

One may conveniently distinguish between the two subdivisions of this earliest coast culture-period by remembering that the Proto-Chimu flourished all along the northern half of the Peruvian littoral and the Proto-Nasca along the southern half.\(^1\) This subdivision is arbitrary, being based on the form of arts prevailing in the two regions. It is not a wholly satisfactory classification, and it may ultimately have to be modified. For example, it may sometime become desirable to delimit at Pachacamac a style which should be called "Proto-Pachacamac." Our information is, however, too scanty to justify such a course as yet, and it is better for the present to rely upon the classification here offered, which does preserve and emphasize the main lines of differentiation between the major varieties of the earliest coast art.

The art of the region around Chan Chan and Moche\(^2\) in the modern department of Libertad is characterized by features that

\(^1\) The terms "Proto-Chimu" and "Proto-Nasca" were adopted by Dr. Uhle after he discovered that the objects belonging to them did not belong to the Chimu and Nasca cultures. The name by which the early but highly gifted people called themselves is unknown.

\(^2\) Here again, the nomenclature must be commented upon. The two places just named are near Trujillo and they are the chief sites for Proto-Chimu ware. The name Chimu is used for the same sites at a later period, when the Chimu culture was flourishing. Chimu is derived from the Mochica place-name Chimorr or Chamorr; Moche is the Hispanicised form for Muchik; Chiclayo was formerly Chajaep; Lambayeque is derived from Nampajek. Cf. Middendorf, 1892, p. 64.
set it in sharp contrast to other Peruvian art-types. As a rule, the other Peruvian cultures are marked by conventionalization. The Proto-Chimu, on the contrary, is comparatively free from conventionalization and is marked by strong realism, especially in the animal forms, “portraits” and “landscapes.” In close association with the elaborate modelling in the round went painted decorations of a type always easy to identify. These paintings were usually in dark reddish brown on a cream-colored slip. In a few cases such colors as light red, orange and buff were used in the vase-paintings. The outlines of the figures are marked by a grace that is unusual in Peruvian art, and in the grouping of the various scenes a striking command of the principles of composition and grouping is displayed. Some of the vase-paintings of this period partake of the nature of genre paintings, and they help us in no slight degree to reconstruct the material culture and customs of the people whom they depict.

It is but right to say here a word or two regarding the reasons that have led Uhle, Joyce and several others to believe that the Proto-Chimu and the Proto-Nasca are the earliest Peruvian arts. The architecture associated with remains of this culture takes the form of massive walls built up of large balls of clay placed in position while still wet and allowed to dry in such a manner that they partly ran together, thereby forming a solid mass of material. Stratigraphic evidence proves that this architecture, of which only a little is left, is the oldest.⁴

Reserving further comments on Proto-Chimu art for a later page, we will now run over the outstanding features of Proto-Nasca art, always bearing in mind the fact that it was probably not only contemporaneous with Proto-Chimu but also closely associated with it on ethnic grounds.

Undoubtedly Proto-Nasca will, in time, serve more truly to explain certain problems than will Proto-Chimu. At the same time, regarded merely as an art, it is not so remarkable. It is more like other Peruvian arts, for reasons that will later appear. Unlike the Proto-Chimu, Proto-Nasca is not characterized by graceful modelling and graceful painting. Rather, it sacrifices both the form of the vessels and the lines of the paintings to a remarkable wealth of coloration. To the novice, it is true, the

⁴ Joyce, 1912, p. 179; Uhle, 1913, pp. 102-103; Means, 1917.
Proto-Nasca vessels appear sombre enough, but the more one studies them the more he becomes impressed with the wonderful richness and variety of their tints. The mere fact that most of them are from the dark side of the color-scale does not impair the effect of subdued richness. If, then, we never find in Proto-Nasca the astonishingly good modelling that excites wonder, and sometimes amusement, at the Proto-Chimu art, the lack is in part made up for by the presence of sumptuous color combinations that may well give valuable hints to modern artists.

It is the opinion of Mr. Joyce that no textiles of this period have survived to the present time.* But for reasons to be enlarged upon later, the present writer ventures to hold the contrary opinion on this point.

Though profoundly different, as has been shown, the Proto-Chimu and Proto-Nasca arts have similarities to one another that are quite as significant as their divergences. The similarities are to be found in the subject-matter of the two arts rather than in the details of their execution. In both, the use of headdresses decorated with animal-faces is apparent; in both, the use of various sorts of masks and of eye-painting is noticeable; and in both the centipede-like tail ending in a human face is often found. An important article by Mr. Joyce affords the material for forming these opinions.⁵

2. THE CULTURE KNOWN AS TIAHUANACO I.

The researches of Posnansky, Uhle, Gonzalez de la Rosa and others have established the fact that the remains at and around Tiahuanaco⁶ in Bolivia represent two sharply differentiated cultures. Of these, the cruder was the earlier. Posnansky, to whom the subdividing is chiefly to be credited, calls this first and simpler epoch "Tiahuanaco Primitivo." The writer, in

---

* Joyce, 1912, p. 200.
⁵ Joyce, 1913b.
⁶ Though we shall fall in with modern usage and employ the name Tiahuanaco, it is to be noted that the early name for the place appears to have been Taypicala. This, according to Cobo (IV, p. 65) and Bandelier (1911, pp. 222 and 243), has the meaning of "Stone-in-the-Center (of the Universe)." The word appears to be derived from the "Aymara" (correctly, Colla) terms taipiri, center, and ecala, worked stone. (Cf. Vocabulario poliglota incaico, 1905.)
seeking for a good English equivalent for this term, decided to adopt one that was suggested by Aegean archaeology—hence "Tiahuanaco I," and also "Tiahuanaco II."

The architecture of Tiahuanaco I was true megalithic masonry. In building a wall, the early Tiahuanaco people adopted the simple but effective method of setting up at intervals large vertical oblong monoliths. In the edges of these nearest to the next pillar grooves were often cut from the base to the top and into them the builders fitted other blocks of stone by means of which a wall of comparatively small stones was made between the large ones.

In all probability Tiahuanaco I was contemporary, at least in part, with Proto-Chimu and Proto-Nasca. Nevertheless, as will be developed later, there is no trace of the early coast types to be found associated with Tiahuanaco I deposits. It is, in the writer's opinion, impossible to say with accuracy whether or not any pottery or textiles have survived from the Tiahuanaco I period. Posnansky, however, figures two rude stone heads used, apparently, as wall-ornaments, dating from this period. ¹

Even a brief study of Tiahuanaco I reveals the fact that it is totally unlike either of the probably contemporaneous coast-cultures. What, then, is it like? Is it an indigenous and autochthonous culture? The whole trend of modern investigation into the ancient cultures of America discourages belief in the autochthonous nature of the Tiahuanaco I culture. It must, therefore, have been derived from some other region. As it obviously is not connected, even remotely, with any of the other cultures in South America that can possibly have been contemporary with it, save for one possible exception, we must study, however briefly, the strands of evidence that bind it to the group of cultures which constitute that exception. It is, then, suggested that the erectors of the Tiahuanaco I culture were related to, or even members of, the great Arawakan stock of Brazil. This is as yet but a theory. Facts, however, lend it a certain color of truth. These facts we will briefly outline.

Far to the south-east of Lake Titicaca, in the Bolivian province of Santa Cruz, is a site called Samaipata which yields cut rocks very suggestive of the stone-work of Tiahuanaco I. We owe

¹ Posnansky, 1911, p. 33.
our knowledge of this place to Baron Nordenskjold, and it is his opinion that the remains at Samaipata are associated with Arawakan builders. Archaeology, then, offers a slender thread with which to bind the Tiahuanaco I culture with the Arawakan stock at Samaipata. But this is not all the evidence afforded by archaeology. The island of Marajo, at the mouth of the Amazon, yields evidences of occupation by a people who had a stone technique of a grade similar to that of the Tiahuanaco I people. Finally the characteristic feature of the better sort of Tiahuanaco I stone-carvings is the continuity of the eyebrows and nose so as to form a T-shaped figure. This feature is also found in some of the pottery heads from Marajo in the Peabody Museum, Cambridge, and likewise it is observable on the secondary decorations of the Weeping God figure at Tiahuanaco. (See Plate VII.)

Furthermore, linguistics and a study of migrations seem to throw some light on the situation. Haddon indicates roughly that there was a shift of peoples from north-eastern South America toward the Titicaca and Samaipata regions. Chamberlain and others indicate that members of the Arawakan linguistic stock are to be found far over toward the Andes at the latitude of Lake Titicaca.

On the whole, then, there is a certain justification for suggesting that the first high-cultured dwellers at Tiahuanaco were derived from stock belonging to the eastern half of the continent. The reader is reminded, however, that this whole point is in an embryonic state of discussion. Only long and systematic work will definitely establish the Arawakan derivation of the Tiahuanaco I people and their culture.

3. THE CULTURE CALLED TIAHUANACO II.

If Tiahuanaco I was probably contemporary with the Proto-Chimu and Proto-Nasca cultures of the coast, Tiahuanaco II is no less probably derived, at least in part, from the latter of those two coast cultures. This will be enlarged upon later on.

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8 Nordenskjold, 1902, 1906, 1906b.
9 See Posnansky, 1914, Plate XXXX.
10 Haddon, 1912; Chamberlain, 1913b, p. 474 ff.
There can be but little doubt that the culture which we call Tiahuanaco II was the most highly developed in South America. It even rivals the Maya culture of the "Old Empire" cities in the southern part of Yucatan.

It may be true that it is dangerous to measure the actual spread of a culture by the boundaries of the territory within which remains of its distinctive products are to be found. Political affinities, of course, cannot be determined by any such evidence; but, nevertheless, the fact that Tiahuanaca II objects are found from Colombia to Argentina is a proof that the cultural dominance of Tiahuanaco II was exceedingly widespread.

As we have seen, there was a shift, in the transition from Proto-Chimu to Proto-Nasca, from a light-toned art enriched by good modelling to a dark-toned art characterized by poor and slight modelling. For reasons to be brought out later it is but natural that we should find the characteristics of Proto-Nasca art carried on to their logical development in the art of Tiahuanaco II. This natural state of affairs is found to exist.

In Plate VII we see an important portion of the largest monolithic gateway at Tiahuanaco. It may safely be said to be an epitome of Tiahuanaco II art. Its characteristics, from our point of view, may be listed thus: (1) A headdress decorated with ray-like tabs. (2) Square-headed chief figure with round eyes from which run down the "tears." (3) A short stout body with a necklace and a short, skirt-like garment held up by bands that run over the shoulders. (4) Four-digit hands holding ceremonial staves. All these elements will, of course, be analyzed in full later on.

In general terms, one may say that Tiahuanaco II art, whether in stone, pottery, textiles or bronze, is the most elaborate we have yet seen. Birds with human bodies, pumas, fishes and other animal forms combine with almost innumerable conventionalized decorations to form an art of surpassing complexity. In the pottery of this period we find a sacrifice of coloration to a perfection of the almost glaze-like finish. In other cases, however, Tiahuanaco II pottery has neither rich coloration nor fine finish. Red and black are the chief colors employed, though sometimes white is found as well. The textiles, however, naturally preserve a wider range of tint. Unfortunately, most of those that have survived into our day come from the coast and so do not repre-
sent Tiahuanaco art as having the austere elaborateness that marks it in the highlands. Indeed, this characteristic of the textiles of Tiahuanaco II on the coast may have been found also on the pottery from that region and period. It may well have been a heritage from the rich-tinted Proto-Nasca period.

In many ways the civilization of the Tiahuanaco II "Empire" was the highest that ever flourished in pre-Columbian America. As has been said, it may not have been wholly a political "empire," but it is probable that all through the wide area where Tiahuanaco II objects are found there was a constant interchange of ideas and merchandise. This opinion is borne out by the fact that all the chief edifices at Tiahuanaco itself were of massive stone. On the coast, however, where the earlier people (Proto-Chimu and Proto-Nasca) had used adobe and where stone was not easily obtainable, the Tiahuanaco II people adapted the old clay-ball architecture of their predecessors to their needs by modifying the clay balls into real bricks of sun-dried clay. These bricks, or adobes, ranged in size from seven or eight inches in length to three feet or more. Different sized adobes were used for different needs, just as different sized stones were used in the similar circumstances.

4. THE RED-WHITE-BLACK AND EPIGONAL CULTURES.

In general, it may be said that the red-white-black ware followed the Tiahuanaco II period of the north part of the coast, and that "epigonal" ware was distinctive of the southern part of the coast. Both were the successors of Tiahuanaco II, and both, especially the "epigonal," were influenced by it and by the earliest cultures. In this period the architecture remained much the same as in the preceding one, and the only radical difference that exists between Proto-Chimu and red-white-black on the one hand and Proto-Nasca or Tiahuanaco II and "epigonal" on the other is that neither of the later types were as technically admirable as the earlier ones.

Leaving for a later page the discussion of the details of this art-period, we will mention the only hint we possess of who the makers of the red-white-black ware were. It seems that the dynasty of Chimu was preceded in a portion of the north part of the coast by another dynasty called Naymlap whose chief seat
was Lambayeque. The Naymlap people came from the north by sea, and they built up a state that was apparently conquered by the chief Chimu. All this, however, is as yet mere unsubstantiated theory.

5. THE CHIMU AND NASCA CULTURES.

With this period one begins to get some hint of the political, social and ethnological conditions under which the people lived. Several authors, ancient as well as modern, give valuable information on this head. All that, interesting though it is, lies without the scope of the present paper. We will therefore content ourselves with observing that in the period which we are now considering the northern portion of the coast, from Tumbez down to Casma, was under the sway of a great chief known to the Incas as Chimu Capac (Great Chimu). The valleys of Rimac, Pachacamac and Chan- cay were ruled by another great chief called Cuismancu. Runahuanac, Huarcu, Mala and Chilca were ruled by Chuquimancu. Ica and Pisco (and perhaps Nasca) were ruled by the powerful chief Chincha.

The different valleys being so divided from one another in political ways, it is not surprising that we find considerable local differences in art-types as well. Yet we have no grounds for assuming that the coast peoples were not rather closely related on ethnic lines, which explains, no doubt, certain widespread resemblances between the arts of the various regions.

The architecture of this period, perhaps because of the influence of Tiahuanaco II, was very elaborate. Adobe continued to be the chief material, but it was used in more complex ways. Palaces, workshops, reservoirs, aqueducts and many other elaborate works were constructed. The custom of using stucco reliefs on walls became fairly common.

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11 See Markham, 1912, p. 222; Joyce, 1912, pp. 50 ff.; Beuchat, 1912, pp. 584 ff.; Means, 1917; Garcia Rosell, 1903.
12 See Cieza, 1864, pp. 233 ff., 1883, pp. 185-193; Garcilasso, II, pp. 181-201; Cobo, 1892, IV, pp. 47-54; Markham, 1912, pp. 200-239; Joyce, 1912, pp. 95 ff.; Garcia Rosell, 1903; Arriaga, 1621.
13 Hrdlička, 1914, pp. 41 ff., and pp. 52 ff.
The artifacts of the period under consideration are chiefly in
the form of pottery, albeit textiles are also present to a consider-
erable extent. In general, designs on Nasca textiles may be said
to take the form of rather simple, but by no means crude, geo-
metric patterns, perhaps with a slight and conventionalized zoo-
morphic element, such as those in Uhle, 1913b, Figures 3, 7, and
9. On both pottery and textiles of this region and period the
colors were much less numerous and splendid than they were in
either the Proto-Nasca period or the Tiahuanaco II period. If,
then, Nasca art can be said to preserve an echo of the color tra-
ditions of its predecessors, and also of their geometric tendencies,
(for some of its chief motifs are derived directly from some of
their minor ornamental details), so, in no less degree, can the
black modelled ware of the Chimu period be said to preserve the
realistic tendencies, as well as some of the decorative motifs, of
Proto-Chimu art.

6. THE COLLA-CHULPA CULTURE.

The name chosen to distinguish this period is made up of the
two names applied by various writers to the people who lived
in it.15

As the general culture-level was so low, it is but natural that
the pottery of this period should be poor. The best collection of
it is that made by Bandelier which is now to be seen in the Ameri-

15 Joyce, 1912, p. 75, Markham, 1912, p. 186, Beuchat, 1912, p. 576, and
others use the term Collas. Bandelier, 1910, pp. 184 ff., calls them Chulpa.
(The double II is without justification.) The term Aymará, often applied
to these people by writers, and even by such first-rank authorities as
Bandelier (1910, pp. 63 et passim), Hrdlička (1911, p. 1) and others, is
entirely misleading. The people who lived in the Titicaca basin between
the time of Tiahuanaco II and the Inca conquests were the Collas. It
was they who produced the culture here to be discussed and who built
the chulpas or burial-towers. The name Aymará was first given to these
people by the Jesuits of Juliaca some time before 1590, and it was estab-
lished in usage by Bertonio (1603) and Torres Rubio (1616). All this
has been emphasized by Markham (1912, p. 192) and Joyce (1912, p. 75)
but it cannot be dwelt upon too often. The mistake of the Jesuits is
accounted for by the fact that the Aymarás, whose original home was
between Cuzco and the continental divide, were conquered by the Inca
Pachacuti and were moved, by him, to Lake Titicaca as mitimacs.
(Sarmiento, 1907, p. 108; Garcilasso, II, p. 50.)
can Museum of Natural History, New York City. It has not seemed to the writer to be worth while to include pictures of this type, so a description will be given in order that some idea of the type may be formed.

In the Bandelier collection are a number of jars from Sillustani, a place that was probably the site of important activities during the Colla-Chulpa period. The vessels are made in two styles. One is a small type of vessel of white clay, rather coarse and undecorated; the other type is made up of red ware, also coarse, with designs in black upon it. Other specimens, doubtless from this period, are a class of rather coarse and clumsy bowls with design suggestive of the "epigonal" of the coast. (See Bandelier, 1910, Plate XXI.) Coarse bottles of dark red clay, sometimes decorated with black lines, and gray bottles with incised rectilinear spirals seem to exhaust the artistic repertory of the Colla-Chulpa potter. In bronze work, however, the Colla-Chulpa folk were much more advanced, as is evidenced by the archaeology of the region where the chulpas abound.

It would be a mistake to close our study of this intermediate period without a brief study of the unusual architectural form that peculiarly marks it. The chulpas are strictly speaking stone towers, either circular or rectangular in plan. They vary greatly in size and neither their use nor their distribution is yet definitely settled. Even with our present limited information, however, it is possible to distinguish several types of chulpa. Sir Clements Markham long ago suggested that the cruder types might have been adopted later by the Incas who evolved from them the less crude types. Without formally accepting this theory, we will discuss each of the types in the order of their apparent antiquity, bearing in mind the possibility that appearances may be deceptive. The most primitive form of chulpa, then, is that which is found at Quellenata and Ullulloma. The former of these places is close to the north-western end of Lake Titicaca; the latter is about fifty miles north-west of there. Primitive chulpas also occur at

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16 Bandelier, 1910, pp. 184 ff.; Bandelier, 1905; Squier, 1877, pp. 376-384; Markham, 1912, pp. 186 ff.
18 Markham, 1871, p. 308.
19 Squier, 1877, pp. 386 ff.
Philip Ainsworth Means,

Sillustani, on the west of the northern end of Lake Titicaca, at Kalaki on the eastern shore, and at Coni and Curahuara far to the south-east of the Lake.\(^{20}\) It will be seen that this type of chulpa was built over a wide area. Speaking in general terms, it is a round stone tower which is smaller at the bottom than at the top. The stones are uncut, and had some binding material. In some cases the roof is flat; in others it is a truncated cone. Stone was the sole material. The edifices of this type belong to the fourth period of Posnansky’s culture-sequence. He calls it the “epoch of edifices of adobe and pirca (uncut stone).”\(^{21}\) This reckoning would place the style just prior to Inca times. The second type was, in outline, the same as the first. It tended, however, to be larger, and the stone was carefully cut so as to make a beautifully built wall. Sillustani, Coni and Kalaki are the chief sites for this type. The third and final type was somewhat the same as type two in regard to the material, but it differed from the other two in being rectangular in plan and very large, sometimes as much as thirty feet in height.\(^{22}\) Unlike the other two types, which had but one interior chamber, this third type sometimes had two chambers, one above the other. It is to be noted that this type is the only one which occurs outside the Titicaca drainage. There is an interesting example of it at Palca, not far from Tacna in northern Chile.\(^{23}\)

The question of who the Collas really were is a complex and


\(^{21}\) Posnansky, 1911b, p. 17.

\(^{22}\) Squier, 1877, pp. 352 ff., 372 ff.

\(^{23}\) Squier, 1877, pp. 242 ff.

The whole question of the distribution of the chulpa-type of building is a highly important one, in all probability. The type has prototypes over a very large area. The writer has found it in the region of Ollantaytambo. It exists in the neighborhood of Oroya (see Dr. William C. Farrabee’s photographs in the Peabody Museum) and something strikingly like it is found at Cuelap and other sites in the region of Chachapoyas. (Bandelier, 1907.) Again, in the district of Huarochiri, buildings of the chulpa type are found in the middle portion of Peru and fairly near the coast. (Hrdlička, 1914, Plates 3 and 4.) At present the evidence is rather tantalizing than illuminating. One can only say that over this wide area there seems to have been a material culture of the same general level as that of the Colla in immediately pre-Inca times.
important one. In considering it one must not forget the presence in the Titicaca basin of another and much lower-cultured stock called Urus or Uros. The general trend of the evidence at hand regarding the Urus shows them to be very low-cultured and quite widely distributed. In fact, their area at the time we are considering extended from Titicaca down to Lake Poopo or Aullagas. It may have extended westward to the Chilean coast. The stock was probably an old one. Boman (1908, I, p. 72) suggests that the Urus were vestiges of the earliest pre-Yuncas (i.e., pre-Proto-Chimu) population, and that they were driven south and east by the earliest high-cultured invaders. At the same time, we must remember that, in the same general area, the higher-cultured Collas had a culture which was similar to that found in the north-western parts of Argentina. It might be suggested that one of these racial elements represents the inhabitants of the Tiahuanaco II "empire" and that the other represents the invading race which may have helped to bring it to a close. But which is which, and if this is the truth, we cannot surely tell. To some it may seem more satisfactory to assume that there were two strata of population—Collas and Uros—who were mutually aloof. Such a state of affairs has been known to exist in Asia, Oceania and elsewhere. Certainly the Titicaca basin is spacious enough to permit isolated groups of Uros to dwell wholly apart from the surrounding Colla communities.

7. EARLY INCA CULTURE.

As has been said before, the culture of the mountain regions away from the sea suffered a general and marked subsidence after the Tiahuanaco II period, a subsidence which we have studied under the name of Colla-Chulpa culture. Therefore, when that gens of the valley of Cuzco which later became the Inca dynasty began to raise its own culture-level and that of the surrounding tribes it had not much artistic tradition on which to establish its own art.25

24 Cf. Chamberlain, 1910, 1910b, 1911, 1913; Boman, 1908; Garcilasso, II, pp. 223-227.

25 It seems to the writer that the character of the Inca gens has never been properly appreciated, save, in a measure, by the late Sir Clements Markham. According to Sarmiento (1907, pp. 37 ff.), the people in imme-
Difficult though it sometimes is to distinguish between early and late Inca pottery forms, it is, in the writer's opinion, possible to establish a series of vessels from Machu Picchu that will serve to throw some light upon the development of the most typical form of Inca (or Cuzco) pottery—the aryballus. But the reader should take care to bear in mind that the simpler and cruder forms, forms probably longer in use than the more advanced types, undoubtedly continued to be employed by the very late generations of the Incas' subjects as cooking utensils, etc., while the finer products of the potter were reserved for less heavy work. In spite of this, however, the fact remains that the cruder types, being very like the Colla-Chulpa pottery both in form and in material, were probably older types of vessels than the decorated and graceful forms. The reader is urged, then,

diately pre-Inca times lived without governmental organization of any sort except that in times of danger a military officer with the title of Sinchi was chosen. Besides this, in the opinion of Sir Clements Markham (1912, pp. 159 ff.), there was a social organization based upon the family at the head of which stood the puric. Several purics combined together into an ayllu or lineage. This system was carefully studied by Sir Clements Markham, and we have to thank him for showing us what the social conditions in the highlands before the rise of the Inca ayllu were. He did not, however, lay stress upon the historical significance of all this. Sarmiento (1907, pp. 40 ff.) tells us that just before the rise of the Incas, there were, in the valley of Cuzco, six ayllus in the possession of the region. Three of these, whose names he did not know, were native; three others, the Alcabisa, the Copalimaya, and the Culunchima, came and settled amicably among them. Later on, the Inca also came from not far off and settled at Cuzco. Strife arose between them and the other families which was not finally subdued for some time. Like the heads of all the other ayllus, the chief of the Incas bore the title sinchi. Hence we get the name Sinchi Rocca, borne by the first historic Inca.

28 The name "Machu Picchu" is the one given to this site by Dr. Hiram Bingham, who visited it for the first time in 1911. Although the name is not a wholly satisfactory one, it has been thought best to continue its use here because the site has already become well known under it, and because the name Vilcabamba-the-Old (or Vilcabamba viejo) is rather clumsy, a fault which outweighs its greater historical accuracy. In any case, "Machu Picchu" is preferable to the "Matcho Picho," "Macho Piccho" and so on of such writers as Sartiges, 1851, and Wiener, 1880. The phrase machu pichu means "old ridge." The late Sir Clements Markham was of the opinion that the cc in the name "Machu Picchu" was a mistake. The name is pronounced Pi-chu, not Pic-chu.
to turn his attention to Dr. George F. Eaton’s work on the osteological material from Machu Picchu, and to Dr. Hiram Bingham’s "Types of Machu Picchu Pottery." In the first place, we are justified in assuming that the delicately formed, well decorated aryballus of the type shown in our Plate XIII was one of the ultimate forms of Cuzco pottery by the fact that it is this type of vessel that is found most widespread, even in regions like Ecuador, Chile and Argentina where Inca influence did not arrive until very late. It will be our task therefore to show in a series the forms that led up to the final aryballus type. This we will now do. The series proposed by the writer is made up as follows:

**First Step.**
Rough, undecorated ware. Eaton, Plate XIV, Figure 4. Bingham, Fig. 48, No. 7a. Also see Eaton, Plate IX, Figs. 3 and 4 for a variation of the First Step.

**Second Step.**
Slightly finer ware, sometimes decorated in colors, with enlarged handles and more pronounced neck. Eaton, Plate XIII, Figs. 1 and 2. Bingham, Fig. 47, No. 6a.

**Third Step.**
Still coarse ware with more pronounced neck. Sometimes decorated(?). Handles small and moved down from the lip. Eaton, Plate XIV, Fig. 5. Bingham, Fig. 48, No. 8a.

**Fourth Step.**

It will, perhaps, be well to say again that the particular crude specimens above referred to are not, in all likelihood, themselves older than the more refined specimens. For example, in the same grave with the specimen representative of the first step, Dr. Eaton found skeletal remains of the coast type, which implies that the pot belonged to people who had come up from the coast at some time subsequent to the Inca conquest of the littoral. The point of the series presented, however, does not dwell in the antiquity of the specimens, but rather in the relative antiquity of the types of form.

To sum up, then, our impressions of the early Inca culture we will say that the time in which the Inca ayllu was extending its ascendancy over the other Quichua tribes in the neighborhood of Cuzco, the people of the Cuzco region were gradually evolv-

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27 Eaton, 1916, Plates V-XIV; Bingham, 1915b, entire.
ing from the simple pottery-types of their ancestors a new kind of pottery which was to find its fullest florescence under the last five Inca rulers. Because of the lack of detailed knowledge of the early Inca period, we shall not touch upon that culture again in this paper.

8. THE INCA CULTURE AT ITS HEIGHT.

As the Inca culture is the nearest to us historically it is but natural that we should know more about it than we do of the rest. It is even possible to draw up a fairly complete and reliable history of the Inca dynasty, especially of the last six rulers. For a long time it was customary to assign all evidences of pre-Columbian culture in Peru to the Incas; indeed, that is still done, unfortunately, by some writers. They disregard the growing evidence which points more and more clearly to the inferiority in many respects of the Incas to their various predecessors.

The Incas were, nevertheless, wonderful people. They had a real genius for government and their state was the only truly socialistic monarchy that has ever existed. The individual was nothing; the state, that is the Inca himself and his blood-relatives, was supreme in all things. It is not surprising that, in a state like this, strongly centralized, autocratic, theocratic and all-controlling, the art of outlying regions should all tend to approximate that of the capital of the dominion ruled by the Inca from Cuzco. This is, in the writer's opinion, the psychological explanation of the fact that from Quito to Chile and from the Pacific to the Brazilian wilderness, vessels, architecture, weapons, textiles and language all conform, with varying degrees of closeness, to the fashion or example set by the people of Cuzco. Typical Cuzco pottery is found wherever the Inca conquerors penetrated; Quichua dialects prevail to-day over the same areas.

As far as shape is concerned, the vessels made by the subjects of the Incas of the later generations are the most graceful in Peru. The aryballus, the beaker, the bowl and many other forms, all very attractive, are found. Dr. Hiram Bingham, whose trips to Peru have resulted in the publication of many valuable pictures of Inca sites and products, has given a résumé of the commoner Inca forms.\(^{20}\) Machu Picchu, the site from which

\(^{20}\) Bingham, 1915b.
most of these objects come, was thought by Dr. Bingham to be Tampu Tocco, the "cradle" of the Incas. He also presented convincing evidence pointing to the fact that the city was Vilcambamba-the-Old, a celebrated sacerdotal establishment of the Incas in post-conquest times. It should be noted that the work of Dr. Eaton has left very little doubt as to the modernity of this site as compared with that of Tiahuanaco or Chimú. Every class of object found there, every bit of osteological evidence, points to the fact that Machu Picchu was built at some time after the Incas had conquered the coast of Peru and had had time enough to be affected by the influence of coast art. We are indebted, therefore, to the Yale Expedition for the unveiling of a city which, though known to travelers for many years, has never, until recently, been photographed and adequately described. Machu Picchu is undoubtedly the most valuable site in the Cuzco region, for it presents an epitome of all that the Incas knew of art, architecture and engineering at a time when they were at the zenith of their power. We shall, therefore, consider Machu Picchu pottery to be representative of all that the pottery of late Inca Peru was, and we shall study it accordingly, assuming Machu Picchu pottery to be all that Cuzco pottery was in the last part of the Inca period.

The characteristics, then, of Inca pottery as shown by the Machu Picchu collections, are: (1) The predominance of almost classically graceful shapes such as aryballi, pelikai, dishes, bowls and so on. (2) The widespread and often-repeated use of certain fixed and definite geometric decorations. (3) The general scarcity of anthropomorphic decoration. (4) The occasional association of perfectly recognizable Cuzco shapes and decorations with some element introduced from the coast, such as modelled anthropomorphic handles on dishes or life-like butterflies painted on the bottoms of shallow bowls. (5) Cuzco pottery is, in general, lighter in tone than either Tiahuanaco II or Proto-Nasca. As has been said, pottery of a pure Cuzco type is found from Ecuador to Chile. In all this huge area a surprising

30 Bingham, 1915, pp. 180 ff.
32 Cf. Bamps, 1879, Atlas; Saville, 1907-1910; Rivet, 1912; Oyarzun, 1910.
steadfastness to the original type is to be observed; but, nevertheless, local sub-types do develop in several cases. Such a one is the Inca style on the islands of Titicaca and Coati in Lake Titicaca. There, though still perfectly definitely related to the usual Cuzco types, the pottery is marked by a tendency to break the decorated surface up into very small geometric areas which are made prominent by the contrasting of dark brown with cream color. This is noticeable in the collections from Titicaca now in the American Museum of Natural History, New York.

As is usually the case, the textiles, though showing affinities of design with the pottery, are richer in the variety of their colors. The Incas' subjects were as good weavers as any in aboriginal Peru. That their art was strong and flourishing at the time of the Spanish conquest is proved by the fact that shortly after the conquest there were produced some of the finest specimens of Inca tapestry that we have.

Unlike their predecessors, the people of Tiahuanaco II, the Incas' subjects, though admirable architects, did not decorate their buildings with any great amount of carving. To replace the decoration applied to the walls of huge stones by the carvings of Tiahuanaco II type, the subjects of the Incas evolved a new type of architecture. It takes the form of exquisite walls made of reasonably large stones laid in courses of quite astonishing accuracy. Often the lowest course would be made of stones of say a foot high; the next course would be slightly lower, and so on to the top. The effect of this technique was a wall of wonderful symmetry and beauty. Such a wall needed no carving to make it sightly. Dr. Bingham gives an excellent picture of this late Inca type of wall.33

This Inca culture, then, was the last of the long series of pre-Columbian Peruvian cultures. With our brief review of the chief features of those cultures thus brought to a conclusion, we will now turn to a detailed analysis of the Plates which accompany this paper and which have been chosen with a view to setting forth the more prominent characteristics of the principal culture-types.

33 Bingham, 1913, p. 488.
III. ANALYSES OF THE ARTS OR CULTURES.

1. A CRITICAL ANALYSIS OF PROTO-CHIMU AND PROTO-NASCA ART.

Aside from examining the Plates that accompany this paper, the reader is urged to examine those that are to be found in the works referred to in the footnote.\(^1\) It is hoped, however, that the examples of the two very early types of art herewith presented will prove sufficient material for those who cannot seek further for it.

Plate I shows five specimens of Proto-Chimu art, all to be found in the Peabody Museum at Cambridge, Mass. It will readily be observed that two characteristics hold true for all the specimens given; these are: light coloration, and grace of line. In Figures 1-4, the chief source of admiration on the student's part is the wonderfully life-like modelling. Figures 1 and 2 are especially remarkable in this respect. In Figure 1 we see a man attacking a deer with a massive club. His small dog looks on. With the exception of the deer's body and the man's feet the modelling is far better than that in some of the early Egyptian and Cretan figures. The man's clothes seem to consist of a loose-fitting shirt with sleeves and of a hat or helmet adorned with two rosette-like protuberances and a sort of frontal ridge. From the helmet proper a strip of cloth runs down to and under the man's chin. The nose of the man is large and somewhat of the Semitic type. The chin is somewhat receding. The dog on this vase is probably one of those which the early people kept for use in the chase.\(^2\) On the body of the vase is to be seen a composition that is very typical of Proto-Chimu art. It is painted in dark brown on the white slip of the vase and, like the modelled group above, represents a hunting scene. It should be noted that the costumes of the figures in the painted part of the decoration differ considerably from that of the modelled man.

\(^1\) Cf. Uhle, 1908, 1910, 1912, 1913, 1913b, 1914; cf. Reiss und Stibel, 1880-87; Baessler, 1902-03; Putnam, 1914; Theresa von Bayern, 1907; Joyce, 1912, 1913b; Beuchat, 1912; Mead, 1915; Squier, 1877; Berthon, 1911; Rivero and von Tschudi, 1851; and many other works.

\(^2\) Cf. Joyce, 1912, p. 125.
The former, for example, have the black "stockings" that are so frequently seen in Proto-Chimu vase-paintings; also, the painted men have a very different headdress from the modelled man. But most important of all is the fact that the painted men appear to be either wearing masks or else to be adorned with face-paint. Indeed, if the latter is the case, the "stockings," "knee-caps" and "sleeves" must be assumed to be nothing less than body-painting. From all of these elements of decoration the modelled man is entirely free. Figure 2 is another type of modelled vase from the Proto-Chimu period. It shows a personage, apparently masked to represent a fox or some such animal, sitting facing a semicircle of five foxes. The personage's headdress, though different from that in Figure 1, is, nevertheless of the same general type. The striking features about this figure are the headdress and the fangs, to both of which we shall refer later. Again, the back of the middle fox is adorned with a design which Posnansky calls signo escalonado—stairsign. To this also, we shall refer, in another connection. Around the base of the vessel, in the region analogous to that occupied by the painted hunting-scene in Figure 1, we see a landscape. The trees and plants are shown by means of shallow lines engraved, apparently with a blunt stick while the clay was still moist, in the reddish slip of the vessel. This landscape is full of charm because of its quaint realism. It is even possible to attempt to identify the tree as an algaroba and the smaller plants as cactus. This sort of vessel sometimes leads students into attempting an "interpretation" of the scene. While the modelled portion of the vessel undoubtedly represents some sort of ceremony employed by the people of that period, it is, nevertheless, dangerous to reconstruct, let us say, a totemic clan organization, from such evidence as this.

As the vases shown in Figures 1 and 2 represent a very large and important sub-type of the Proto-Chimu pottery, it will be well to summarize briefly our impressions of them before going on to an examination of the other sub-types.

We see that the vessels of this sub-type comprise two separate areas of decoration, each marked by a distinct technique. In both the painted (or engraved) area and the modelled area of
the two vessels we observe the following features: (1) A marked
tendency toward realism of representation; (2) A decided lack
of rich and varied coloration (dark brown, red and cream color
being the tints found); (3) A gracefulfulness of line which is
not constricted by any sort of conventionalization; (4) The use,
by several of the human figures, of masks or face-painting, of
fangs and of an easily recognizable type of headdress. If the
reader will examine the Plates in some of the works already
referred to he will see further examples of these characteristics,
as well as some others that occur in Proto-Chimu pottery of this
sub-type. For example, look at the scenes from vessels shown
by Mr. Joyce. These show new forms of the headdress, the use
of face-painting and of masks, the presence of fangs, and also
a curious use of girdles ending in serpent heads. The black
"stockings" also are found in these figures, as well as in Figure
1 of our Plate I. Also, the use of peculiar fluted wings is rather
often met with.

So much, then, for the modelled and painted sub-type of Proto-
Chimu vases. There are still several other types for us to con-
sider. Look, for example, at Plate I, Figure 3. This specimen,
the original of which is in the Peabody Museum, Cambridge,
comes from Chimu (Trujillo) and shows, in addition to the
typically Proto-Chimu fangs, a further development of the head-
dress. The latter seems to be composed of the stiff ridge or
core found in the headdresses of Figures 1 and 2 with the addi-
tion of ornaments that may be intended for feathers. These
feathers are important, and they will be referred to in connection
with our analysis of Proto-Nasca art and of the Chavin Stone.

Plate I, Figure 4, shows an example of a type of vessel that
has always excited admiration in students of ceramics. It is
called the "Portrait type." Possibly this particular example is
not really Proto-Chimu, but similar "portraits" have been found
that have painted on them unmistakable Proto-Chimu decorations.

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4 Joyce, 1912, pp. 126, 127.
5 See Joyce, 1912, p. 155, for an admirable specimen of Proto-Chimu
vase-painting with fluted wings, serpent-tail and fanged masks. Also
examine plates in Reiss and Stübel, 1880-87, and in Baessler, 1902-03.
6 See, for example, Jacquemart, 1873, pp. 190 ff.; and Young, 1879, pp.
404 ff.; Squier, 1877, pp. 180 ff.
As the specimen here shown has a headdress that has several points in common with that of the chief figure in Figure 1, it is assumed for the nonce that this "portrait" is Proto-Chimu. No one who has studied a series of these human-faced vessels and has noticed the wide differences and unfailing individualization that characterize each one of them can fail to lean toward the belief that this type of vase is indeed a "portrait type." There is absolutely nothing of inherent impossibility about the idea that a people so highly gifted with plastic skill as the Proto-Chimu people may have developed the habit of employing their vessels as a medium whereby to perpetuate the likenesses of their great men. In any case, empirical evidence leads us to believe that some such habit did prevail, for every good specimen of the "portrait type" portrays an individual, not a type. And it should be noted that realistic portrait-making is in entire accord with the marked realistic tendencies of the Proto-Chimu culture pottery. Nor are "portrait types" lacking in other parts of America.\(^7\)

Last of all, in the matter of Proto-Chimu sub-types, comes that variety which is represented by Plate I, Figure 5. In this division come almost innumerable stylistic decorations which, though they may show slight conventionalization, never show geometrical tendencies to the exclusion of all curves. The present specimen, in the writer's opinion, is intended to represent a starfish.\(^8\) In this type also occur many variations of the "stair-sign" (signo escalonado) often in conjunction with the starfish (or octopus) motif.

Passing over for the present the numerous forms of pottery which may some day be definitely assigned to this period (a passing-over process which will have to be repeated many times in the present state of our information), we will endeavor to draw up a tentative classification of the Proto-Chimu sub-types.

Sub-type I Landscapes. Vessels having modelled scenes as well as painted or engraved ones. usual colors: white or cream slip, dark brown and red.

\(^7\)Spinden (1916b) claims them for Central America, and Holmes (1916b) shows an excellent example of aboriginal portraiture from Quirigua.

\(^8\)It is the opinion of Prof. MacCurdy that the design here mentioned is derived from the octopus, not from the starfish. This, of course, may well be the case.
Sub-type II Portraits. The faces of the portraits often have features in common with Sub-type I and Sub-type III, (such as headdress, formal incidental decoration motifs, etc.).

Sub-type III Partly conventionalized decorations. Even these, however, are seldom rectilinear entirely. Cream and red are the more usual colors.

Sub-type IV Numerous miscellaneous types not yet decided upon.

Having completed our study of the distinguishing elements of Proto-Chimu art, we will now examine into the traits of Proto-Nasca art.

We have seen that realism, grace of line and light coloring were three of the chief characteristics of Proto-Chimu art. We find in Proto-Nasca art an almost complete reversal of these features. There is, to be sure, an apparent attempt at realism in some of the Proto-Nasca sub-types, but it is an unsuccessful one in most cases. Look, for instance, at Plate II, Figure 2, and at Plate II, Figure 1. In both of these we have a survival of the wonderful modelling that marks out Proto-Chimu art from all the rest. Both of these specimens preserve a certain degree of realism. The former, to note the most prominent feature in each case, holds in his left hand a spear-thrower almost identical with those found in Peru by Dr. Uhle.\(^9\) It would be hard to find a better representation of an object than this one. Then, too, the hands on the other specimen mentioned are absolutely realistic. Their realism consists above all in this: That they are shown in the natural closed position and the finger-nails of the fingers are not shown. These two specimens, therefore, both with five-digit hands and fairly well-modelled heads, may be said to represent a survival of the Proto-Chimu art-tradition in the Proto-Nasca type and, at the same time, to constitute the nearest approach of Proto-Nasca art to realism.

Wares of this type were not, however, the most characteristic expression of Proto-Nasca art. Far more common and far more typical were such productions as those that appear on Plate II, Figures 3-6, and Plates III and IV. Excellent examples of Proto-Nasca plastic art are given by numerous writers, to whose

\(^9\) Uhle, 1909.
work the reader is urged to refer.\(^{10}\) By study of the Plates that accompany this article and those that go with the works here referred to, it will be seen that in the matter of form the Proto-Nasca pottery was not so diverse as the Proto-Chimu. A tentative division into sub-types will, as in the case of Proto-Chimu, be offered for the Proto-Nasca art. At present we will limit ourselves to a consideration of the decoration.

Color is indubitably the "strong point" of Proto-Nasca art. For example, Plate II, Figures 3, 4 and 6 are all of remarkably rich tonality. Red, brown, gray, yellow and black, as well as cream-color, are the tints most frequently met with. The finish of some of the Proto-Nasca pots is so lustrous as almost to suggest a glaze. As for the subject-matter of Proto-Nasca art, it cannot be so easily described as that of Proto-Chimu, although the two have much in common in that respect. Proto-Nasca vase-paintings mostly concern themselves with the portrayal of a few personages who, being few in number, occur again and again in the vase paintings. These paintings were no doubt supposed to represent deities or mythical persons; at all events, there is absolutely nothing realistic about them; they are merely elaborate and formal portrayals of putative objects of veneration. The chief personages of Proto-Nasca art seem to be two in number. Each occurs in several variations. We will describe them in turn, applying arbitrary names for the sake of ease of identification.

The "Centipede God." See Plate II, Figures 3 and 4, Plate III, Figures 1 and 2, and Plate IV, Figure 2. The name chosen is suggested by the fact that this 'god' is usually shown as having a long body at right angles to his face and fringed with spike-like objects that are evidently conventionalized legs. Sometimes he has a series of subsidiary human faces where the legs ought to be; sometimes both legs and faces occur (as in Plate III, Figure 2). Again, the "Centipede God" is shown as a man, strongly conventionalized to be sure, who has centipede attributes such as the girdle shown in Plate II, Figure 4. It is very interesting to note certain well nigh invariable features that mark the portrayal of the "Centipede God," whether that 'god' is

\(^{10}\) Joyce, 1912, Plate I, Joyce, 1913b; Therese von Bayern, 1907; Reiss u. Stübel; Baessler, 1902-03; Berthon, 1911, Plates I-VI; Uhle, 1913b, p. 358 ff.
the chief portion of the design or merely a comparatively insignificant adjunct to the design. These features are: (1) The use of a very distinctive mouth-mask; (2) The predominance of hands with less than the true number of digits, usually with four digits; (3) The frequency with which the tongue is shown sticking out of the mouth; (4) The almost invariable presence of a broad flat headdress in the form of a rather highly conventionalized human face; (5) The frequent appearance of ceremonial staffs held in the hands. We will say a few words about each of these features in turn.

(1) The Mouth Mask. Plate II, Figure 3, and Plate III, Figures 1 and 3, show very typical forms of this element. In Plate III, Figure 1, it is seen to consist of a central portion with mouth- and nostril-holes and of two wing-like portions, one on each side of the mouth. These wings are marked by lines of a conventional nature that may be a survival of the curling-feather-like rays that distinguish the mouth-mask of Figure 3. These rays are perhaps related to certain elements of decoration that occur in later arts, as well as in other sub-types of Proto-Nasca art.

(2) Four-digit Hands. Plate II, Figure 3; Plates III, Figures 2 and 3, and IV, Figure 2, all show typical examples of the four-digit hands that so often accompany, as in all these instances, one or more of the several criteria that mark this "Centipede God" motif. The development from natural five-digit hands to these very artificial conventionalized four-digit hands is a matter of great importance, as will be shown in connection with Tiahuanaco II art.

(3) The Protruding Tongue. The Plates already mentioned show this feature. In the pottery with the "Centipede God" motif the protruding tongue is not nearly so widely developed as it is in some other cases, especially in that of the textiles. But even in the "Centipede God" figure on Plate III, Figure 2, the tongue shows the beginnings of decoration on its upper surface. The element of tongue-decoration becomes very prominent in other types of Proto-Nasca pottery.

(4) The Broad Flat Headdress. Plate III, Figure 1, shows a standard form of the "Centipede God's" headdress. The brim almost always consists of at least two layers separated by a line. In the center, over the eyes of the 'god,' is a conventionalized
human face. Typical forms of this headdress are shown on Plate II, Figure 3, on Plates III and IV.

(5) The Ceremonial Staffs. The Plates already mentioned show good examples of the staffs. It is to be noted that in vase-paintings where the mouth-mask, headdress and hands preserve the greatest amount of naturalism the staff most closely approximates the spear-thrower shown in Plate II, Figure 2, though at no time is the resemblance very strong. In the more conventionalized designs, however, the staffs (here usually two in number and so arranged as to be bilaterally symmetrical) are themselves so conventionalized as to be scarcely definable in regard to their use.

Bearing in mind the well-known principles that apply to decorative arts, the principles of elimination and simplification which will be spoken of later, the writer ventures to suggest that of the two groups of pottery that we have been studying, that exemplified by Plate II, Figures 1, 2 and 3, is the older, and that the "Centipede Gods" on Plates II, III and IV were a later style. So much, then, for the modelled ware and for the "Centipede God" motif.

We will now examine another motif which may be called, for the sake of convenience, the "Multiple-headed God." Our Plate II, Figure 5, shows an excellent specimen of this motif. Another is shown by Joyce (1912, Plate I). In this motif the heads of the personage consist of hardly more than eyes and mouth and tongue. In some cases, the body of the 'god' has a chief head in approximately the correct position. Then, running out from the shoulders, are a lot of subsidiary heads attached to the body by their run-out tongues. The subsidiary heads are decorated by feather-like rays reminiscent of the decorations on the mouth mask seen on Plate III, Figure 3. Sometimes, as in Joyce's Plate I, the chief head has a headdress of the type associated with the "Centipede God." Also, the "Multiple-headed God" and the "Centipede God" have other points in common, notably:

(1) The occasional presence of a centipede-like girdle with the tongue sticking out (see Joyce, 1912, Plate I); (2) The presence of four-digit hands (though five-digit hands sometimes appear in both); (3) The presence of the minor decoration, seen in our Plate II, Figure 3, and in Joyce's Plate I, made up
of two thick rings with a tassel or tassels hanging from them: (4) The beginnings of a marked tendency toward bilateral symmetry, both of line and of color: (5) The continuance in the "Multiple-headed God" motif of the rich coloration found in the "Centipede God" motif. (Joyce's Plate I shows the presence of buff, blue, yellow, purplish-red, pink, white and black.) The mouth-mask and ceremonial staff usually do not appear in the "Multiple-headed God" motif designs.

The "Centipede God" and the "Multiple-headed God" appear to be the chief personages of Proto-Nasca vase-painting. They do not, however, by any means include all the forms that go to make up this complex art. Space permits us to mention only one other constantly recurring feature. This is the human face which is to be seen in our Plate IV, Figure 2, and in Joyce's Plate I, at the base of the vessels. When this face appears thus, painted, not modelled, it strongly suggests the modelled faces that appear in Plate II, Figure 1. The manner in which the eyes are shown, the hair-dressing, the nose and the mouth are all strikingly alike in both the modelled and the painted versions of the motif. At the same time, it should be noticed that very often lines suggestive of tears run down a short distance from the eyes of the painted forms, but not from those of the modelled ones.

What has been said of Proto-Nasca art is, of course, very far from beginning to be an exhaustive study of that subject. It is, however, enough to give a fair idea of the chief features of that culture. It is but right to say, nevertheless, that aside from the vases bearing decorations more or less anthropomorphic or zoomorphic, whether modelled and painted or merely painted, there is another class of Proto-Nasca vessels which, though having the rich coloration and the same general technique of the other classes, is merely decorated with such patterns as dots, lines and so on like those which appear in some of Berthon's Plates (1911).

We will now attempt to draw up a classification of the subtypes of Proto-Nasca pottery. Then we will take up the question of Proto-Nasca textiles.

Although all Proto-Nasca pottery may be said to be distinguished by a subordination of form to color and of realism to
complexity, it is not enough for us to content ourselves with this general sort of statement. We must look further with a view to establishing various sub-types of Proto-Nasca art, for it must necessarily be assumed that the people who produced the art flourished for at least two or three centuries and that they developed in that time a number of modifications which appear in their productions. Before we do this, however, we must definitely assure ourselves as to whether we have been correct in assuming that Proto-Nasca art was indeed related to or descended from Proto-Chimu art. For the present we shall content ourselves with examining into the relationship of the two without attempting to prove the descent of one from the other. The Plates in this article, those in Joyce’s article on the Clan-Ancestor (Joyce, 1913b), those in Berthon (1911), and in the articles by H. R. H. Prinzessin Therese von Bayern (1907), and Uhle (1914), afford ample material for a comparison. An examination of the two arts brings out the following points of contact: (1) The use of eye-painting and masking; (2) The presence of feather-like ornaments; (3) The use, in connection with the costume, of various appendages and adornments derived from or suggested by animals or parts of animals (i. e. such elements as the centipede girdles); (4) The gradual transition from realistic, modelled, five-fingered Proto-Chimu art to partly realistic, modelled five-fingered or four-fingered Proto-Nasca art, together with the apparently contemporaneous rise of non-modelled, constantly more conventionalized forms of vase-painting.

From the foregoing it will be seen that a very real underlying similarity of subject-matter binds Proto-Chimu art to Proto-Nasca.

Reserving for another place the critical consideration as to the descent of Proto-Nasca art, we will now present a tentative classification into sub-types on a combined basis of form and decoration.\textsuperscript{11}

\textsuperscript{11} The author wishes to call attention to the very able study of Nasca pottery by Edward K. Putnam (1914), and to say that he departs from the classification of Proto-Nasca pottery offered by Mr. Putnam only because it is too detailed for his present purposes and because it does not emphasize the points he wishes to bring out.
### CLASSES

<table>
<thead>
<tr>
<th>I</th>
<th>Modelled and painted ware</th>
<th>The class most like Proto-Chimu.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a Semi-realistic</td>
<td>That is, having fair modelling in combination with five-digit hands.</td>
</tr>
<tr>
<td></td>
<td>b Non-realistic</td>
<td>That is, poor modelling combined with four-digit hands.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II</th>
<th>Painted ware—not modelled</th>
<th>The predominant Proto-Nasca type.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a “Centipede God” Motif</td>
<td>Perhaps derived in part from the Proto-Chimu habit of masking.</td>
</tr>
<tr>
<td></td>
<td>b “Multiple-headed ‘God’” Motif</td>
<td>Linked to “Centipede God” in several ways (see above) and to Proto-Chimu by use of feather-like ornaments.</td>
</tr>
<tr>
<td></td>
<td>c Painted human face motif</td>
<td>Found usually on the same vessels as the two foregoing types, it is, at the same time, strongly like Class I, a, and Class I, b.</td>
</tr>
<tr>
<td></td>
<td>d Miscellaneous</td>
<td>Forms made up of all sorts of elements borrowed from the foregoing types.</td>
</tr>
</tbody>
</table>

Having reviewed the distinguishing marks of Proto-Nasca art as represented by the pottery, we have now arrived at the important question of Proto-Nasca textiles. It has been said by good authorities that there were no textiles dating from a time prior to the rise of the culture of Tiahuanaco II.\(^\text{12}\)

It is, however, the opinion of the present writer that this belief is a mistaken one. It will, no doubt, be granted by anyone that if Proto-Nasca textiles do survive to the present day, they will have the same or similar designs upon them as do the pottery remains. We shall endeavor to show that such designs do survive in textiles. Before doing so, however, it will be well to remind the reader that there is no class of textiles that can safely be assigned to the Proto-Chimu culture.

The reader’s attention is called to Plate IV, Figures 1 and 3. The first shows a woven cloth from Ica now in the Museum of

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\(^{12}\) Joyce, 1912, p. 200; Beuchat, 1912, p. 574.
Fine Arts, Boston. The second shows a border from an Ica shawl in the American Museum of Natural History, New York.

We will begin with an examination of Plate IV, Figure 3. In it we discover a number of striking analogies with Proto-Nasca pottery designs. Like the vase-paintings of the “Centipede-God” type, this design has: (1) A mouth-mask which combines wing-like side ornaments of the same type as those on Plate III, Figures 1 and 3, with a pair of feather-like ornaments reminiscent of those in Plate III, Figure 3. (2) The hands of the figure (as far as one can tell) and its feet have less than the true number of fingers and toes. (3) The tongue is run far out and is highly decorated, a tendency already shown in the pottery. (4) The headdress is broad and flat; it has a brim made up of two layers and there is a conventionalized human face in the center. Compare it with the headdresses on Plate II, Figure 3; on Plate III; Figure 1, and on many other Proto-Nasca vase-paintings of the “Centipede God” type. Also remark that in this textile design, as in some examples of the “Centipede God” pots, the centipede element is preserved by the girdle-like appendage. The tongue of the figure likewise reminds one of the centipede motif. In other words, of the five criteria that we found to be distinctive of the very important “Centipede God” motif Proto-Nasca vessels, four are present in the textile design which we have been studying. Does not this suggest that the textile and the vase-paintings in question have a common source which accounts for their similarities in subject-matter? Again, Plates V and VI seem to have several points in common with Proto-Nasca pottery, although, on account of the comparative complexity of their embroidered designs, it is hard to know whether to compare the personages they portray with “Centipede God” or with the “Multiple-headed God.” For this reason, therefore, it will be best for us to content ourselves with comparing these textile designs with Proto-Nasca vase-paintings in general. The following features, then, may be observed in both the textiles in question and in various specimens of Proto-Nasca pottery: (1) The mouth-mask with wing-like side ornaments; (2) The protruding tongue, highly decorated and endowed with centipede-like attributes; (3) The broad flat headdress decorated with a conventionalized human face; (4) The color-scheme is very suggestive of Proto-Nasca pottery.
The foregoing remarks are meant to convey the impression that Proto-Nasca designs do occur on both pottery and embroidered textiles. Since this is so, the writer finds it impossible to imagine how anyone can assume, as some have done, that they were not made by the same people. Differences between the textile designs and the pottery designs do exist, of course, but in the writer's opinion, they may all be explained by the difference in medium, the technique of pottery decoration not unnaturally causing results divergent from those produced by textile embroidery.

Without pausing at present to discuss the transition from Proto-Nasca art to Tiahuanaco II art, we will now turn our attention to the region of Lake Titicaca and study the early cultures in that area.

2. A CRITICAL ANALYSIS OF TIAHUANACO II ART.

Hitherto in our study we have had to deal mainly with pottery and textiles. In the case of Tiahuanaco II art stone adds itself to the other two as an important art-medium. If it were our purpose to follow Tiahuanaco II art in all its ramifications, we should have to consider the bronze work of northern Argentina as well. The chief media, then, for the art of the exceedingly important period we are about to study are: in the highlands, stone and pottery; in the coast-regions, pottery and textiles.

We will first examine the Tiahuanaco II art with a view to setting forth its content and characteristics. The reader is urged to turn to Plate VII which shows the chief figure of the great monolithic gateway at Tiahuanaco. The Plates in Posnansky's work on this site should likewise be consulted. For want of a better term we have referred to this figure as the "Weeping God." Variations of it occur over a huge area, and in stone, pottery, textiles and bronze. Sometimes the "tears" are lacking, but there is always some other feature to identify the several variations. We will now minutely examine the Weeping God on the great monolithic gateway. He is a short stocky personage with a large head which is almost square. Around the head is a sort of frame; the inner band of the frame is adorned with a series of the sign which we shall find often later on.

13 Posnansky, 1914. Plates LXV-LXXXIV.
Standing out from the inner band are twenty-four ray-like tabs or tassels. These tassels, all of them conventionalized, fall into three groups or classes. (1) The puma-headed tassels, six in number and much conventionalized; (2) Tassels, seventeen in number, composed of what look like ribbons ended off by stone rings, but which cannot well be described with accuracy because of their conventional nature: (3) One anthropomorphic tassel showing the conventionalized face of a man with eyebrows and nose shown continuous. The face of the Weeping God has been destroyed by time to a deplorable extent, but two large round eyes, deeply sunk, remain almost unharmed. From the eyes hang two bands ended off with puma-heads. On each of the bands are two sunken dots suggestive of “tears.” The nose of the figure has been shattered, but it was probably once quite prominent. At present it is squarish and rather broad and long. The whole face is covered over with traces of secondary ornamentation. The body is not separated from the head by any definite neck. The mouth is a mere rectangular slit sunk in the face, totally lacking in any true modelling, the body is short and chunky, and the legs are much too short to be in proportion, unless, indeed, a kneeling posture is indicated. The garment of the figure is a short fringed skirt held up by shoulder-bands. The top of the skirt is marked with rectangular decoration of a type to be observed elsewhere on the carving, and by two puma-heads similar to those on the headdress and elsewhere. The fringe of the skirt is made up of six human faces of the same type as that noted on the headdress. The shoulder-bands are adorned with a conventionalized figure alternated with conventionalized bird-heads. A large breast ornament hangs between the shoulder-bands. It has the form of a fish in semi-lunar posture with his head to the left and turned upward and his tail, to the right, also turned upward. The face of the fish recalls the conventionalized human faces already noted. Just below the fish is a repetition of the conventionalized figure that appears on the shoulder-bands and two other examples of the bird-heads that also appear there. The arms of the Weeping God, though not at all true to nature, are the best modelled parts of the figure. At each elbow are two puma-heads, one above the other. From the two lower puma-heads hang two more conventionalized human faces. The hands of the figure have but four digits. In the right hand is a large
ceremonial staff. The upper half of it bears a rectangular decoration just like that on some of the tabs of the headdress. It is surmounted by an indeterminate object. The lower half of the staff is decorated in much the same way save for the fact that the central panel is sunk as it is on the upper border of the skirt. The base of the staff consists of a conventionalized bird-head. In the case of the staff in the left hand of the Weeping God we find the lower half identical with the one just described. The upper half, however, is bifurcated and the two prongs are topped by bird-heads similar to those already seen on the breast-ornament.

Having enumerated in detail the features of the Weeping God, it will be well for us to note in general terms some of its characteristics. In the Weeping God, then, we have a highly conventionalized bas-relief in stone which shows considerable artistic advance. For one thing, the tendency toward bilateral symmetry noted in connection with Proto-Nasca art appears again here, and it has gained considerably in strength. Save for the staffs and the breast-ornament, the Weeping God is bilaterally symmetrical, and the exceptions to that symmetry do not in the least interfere with the impression of perfect bilateral balance. Moreover, the constant re-statement of three or four motifs of decoration in various combinations is eloquent of conventionalization that has been long in developing. Lastly, the technique of the bas-relief is of that square-edged type which would naturally develop out of a round-surfaced stone technique after conventionalization had set in.

On the same gateway with the Weeping God are forty-eight secondary figures in relief of the same type. There are twenty-four on each side of the central figure. Here again, the tendency toward bilateral symmetry is observable, for all the figures face toward the Weeping God. These secondary personages fall into two classes: (1) Those with bird-like bodies and human faces; and, (2) Those with bird-like bodies and bird faces. Each of them bears before him a staff which approximates in form to one or the other of those held by the Weeping God. All the figures of both classes have four-digit hands, tears and tear-lines, and a constant repetition of the \( \text{扶} \) sign, and of the puma-, fish- and bird-head motifs. The wings of the figures are, in part, almost realistic, and they recall the fluted wings we noted in con-
nection with the Proto-Chimu art. All the figures are represented as running toward the Weeping God, and the speed of their motion is well indicated by their cloak-like garments which are streaming out behind them.

Repetition and re-statement of decorative motifs and themes, together with the tendency toward symmetry, may be said to be the underlying principle of the conventionalities of Tiahuanaco II art as embodied in the monolithic gateway. It is especially noted in the frieze which runs the whole length of the gateway just below the Weeping God and just above the doorway. Throughout that whole composition fragments and portions of motifs already noted can be picked out.14

Aside from the typical Tiahuanaco II decorations on the several gateways at Tiahuanaco (the others are unimportant), the same or similar motifs appear on the pottery from that vicinity. The American Museum of Natural History has a fine collection of Tiahuanaco II pottery from Copacabana and Tiahuanaco. In general the tonality is rather sombre, red and black being the most frequent colors. Sometimes, however, white and orange also appear. In the Peabody Museum at Harvard University there is a small but excellent cup of this period decorated with the face of the Weeping God. Sometimes, as in the case of some of the New York specimens, the Weeping God appears in the pottery without his tears; at other times the decoration takes the form of parts of the secondary motifs, such as puma- or bird-heads in the Tiahuanaco style, or variations of the second type of tab on the Weeping God’s headdress (i.e. the “ribbon-and-stone-ring” motif). Cups, bowls, ollas and vessels with spouts like those on teapots are the commoner forms. One of the New York specimens measures almost a foot across although it is but a fragment. Modelled puma-heads in clay also occur. In short, the plastic art of the Tiahuanaco II period, although it is none too plentifully represented in our museums, is richly diversified.

Our Plate VIII, Figure 1, shows a poncho from Tiahuanaco now in the American Museum of Natural History, New York. The writer believes that, although it bears none of the motifs so far shown to have been typical of Tiahuanaco II art, it does bear a swastika-like motif on its border, and is therefore to be

14 See Posnansky, 1914, Plates LXXIII-LXXXI.
connected with a cup with the same motif shown by Joyce (1912, p. 207). This cup, both because of the puma-heads and because of the general technique, is obviously Tiahuanaco II. The swastika is a motif which is excessively rare in Peruvian art. The ones in this specimen are not perfect in form. The reader is warned that this garment may not be Tiahuanaco II after all, though the writer now believes that it is.

Plate VIII, Figure 2, shows a fine piece of cloth from the Nasca region. It has affinities with both the Proto-Nasca and Tiahuanaco II styles as follows: With Proto-Nasca, face-painting (or masking), centipede element, and coloration; with Tiahuanaco II, tear-lines, eyebrows and nose in T form, three-digit hands. The specimen is in the Museum of Fine Arts, Boston, and is the gift of Dr. Denman Waldo Ross.

Though it may at first seem illogical, we will now turn our attention to the Tiahuanaco II art of the coast; then we will study it in another region of the highlands. The reason for this course will become apparent later.

The writer regrets that he has not been able to obtain any satisfactory pictures of coast Tiahuanaco II art. Much material is readily accessible to the student, however, and the following works should be consulted: Baessler, 1902-03; Reiss und Stübel, 1880-87; Holmes, 1889; Oyarzún, 1910; Uhle, 1901, 1902, 1903, 1908, 1910, 1910b, 1910c, 1912, 1913, 1913b, 1914; Putnam, F. K., 1914; Therese von Bayern, 1907; Beuchat, 1912; Joyce, 1012, 1913b; Bamps, 1879. (The reader is especially referred to the works in italics.)

It will be remembered that in the Tiahuanaco II art of the interior two things were very noticeable: the tendency toward bilateral symmetry in the design, and the comparative poorness of coloration. Of these characteristics only the former appears on the coast. As in the case of Proto-Nasca art, coloration on both vessels and textiles was extremely rich. For example, look at Plate 134, Figure 373, in Baessler. The design that appears at that place shows two birds with squarish heads. The design comes from Pachacamac. A detailed description of it may be of use to the reader. The two birds, whose heads alone appear, face one another. They have hawk-like beaks, darkened eye-areas and headdresses adorned with tabs ending off in three fringes just like those on the minor figures of the monolithic gate-
way at Tiahuanaco. The angularity so noticeable in the art of this period at Tiahuanaco itself is here preserved to a considerable degree. Between the two bird-heads and around each of them is a frame or border adorned with repetitions of the \[\text{sign}\]. Although the Plate in question is not in color, several tints are indicated. Again, Baessler, Plate 144, Figure 403, shows a wonderful specimen of coast Tiahuanaco II art. It is a goblet from Pachamac adorned with a very beautiful design. The colors are cream, purple, gray, brown, red and black. The finish is lustrous and the arrangement of the color-areas is masterly. The decoration resolves itself into several bands. At the top is a band of the stair-sign motif; it is gray with purple borders. Attached to the outer edge of the borders are a number of conventionalized puma-heads in purple. They are reminiscent of those on the monolithic gateway. Those on the top of the band face to the reader’s right; the ones at the bottom face to the left. On the gray central stripe of the stair-sign band are a number of conventionalized three-digit bands in black and gray alternated with similar feet in brown, cream and black. Below this band of decoration comes a narrower one made up of \[\text{signs}\] in red on a cream ground. Below that, in turn, comes a wide band of black on which is painted an almost bilaterally symmetrical square-headed Weeping God. A slight difference in the two ends of his mouth is the sole exception to symmetry. His eyes are in cream and black and, like those of the Weeping God on the monolithic gateway, are large and round with a band of “tears” running down from each of them. The face is red, the nose, gray in color, is broad and squarish like that of the Weeping God at Tiahuanaco. His gray lips form a rectangular mouth containing three groups of rectangular teeth and two groups of fangs, the order being, from left to right, teeth-fangs-teeth-fangs-teeth. The teeth are cream-colored. Finally, at the bottom of the design, comes a band containing twelve oblong rectangles on each of which are two small disks of color with a dot in the center. These rectangles are arranged in double file, six in a row. They are arranged in the manner here approximately indicated, and they may be said to be a sort of study in color-arrangement. Numbers 1, 3, 5, 8, 10 and 12 are red with cream disks; 2 is cream with purple disks; 4, 9 and 11 are gray with red,
purple, red disks respectively; 6 and 7 are purple with cream disks. What this design can have been intended to represent it is difficult to imagine. The only thing it seems to bear the slightest resemblance to is the group of finds on the island of La Plata, Ecuador, which Dorsey called "Perforated and engraved stones." These objects are small rectangular oblongs upon which are engraved circles with a dot, the number varying from three circles up to eight. Dorsey suggests that perhaps the stones in question were used in some game.\(^{15}\)

![Fig. 1.](image)

The decoration composed of small circles with a dot in the centre occurs also on some objects from Machu Picchu. Its occurrence there may mean one of several things: (1) That some subjects of the Tiahuanaco II "empire" were once at Vilcabamba and left these objects behind them; (2) That the subjects of the Inca who dwelt at Vilcabamba happened to see the motif on some remains of the former period and copied it; (3) That the design, which is essentially simple, was "invented" twice, first by the coast Tiahuanaco II people, secondly by the Inca's subjects. The writer inclines to the belief that the last is the correct explanation. It is, however, so simple a design that it has been "invented" again and again in various parts of the world.

One more example of Tiahuanaco II art in connection with the pottery of the coast will serve to round out our present brief account of the matter. It is found in Baessler, Plate 140, Figure 392, and it shows another variation of the square-headed Weeping God motif. The colors are red, cream, brown and white. The figure is shown at full length. As before, the resemblances to the Weeping God of Tiahuanaco, despite the divergences, are

\(^{15}\) Dorsey, 1901, p. 262, and Plate LVII.
very marked. The face of this coast Weeping God, then, is surrounded by a frame strikingly like that of its prototype. From the inner hand decorated with dots spring eleven tab-like decorations which fall into three groups on the basis of form: (1) Three straight tassels ending in a fringe of three pieces; (2) Six tabs reminiscent of the ribbon-and-stone-ring tassels of the Weeping God of Tiahuanaco; (3) Two long tabs ending off in an affair similar to the fringed tabs of the first type. All these are arranged about the face in such a manner as to result in absolute symmetry. In fact, the whole figure is absolutely symmetrical save for the arrangement of the color-areas. The eyes are cream and brown and are large; the "tears" are indicated merely by two lines, one running down from each eye. The nose is broad and square; the mouth rectangular with eight square teeth and no fangs. Two hands with four digits grasp two staffs which are exactly alike except for color and which are arranged symmetrically. They suggest tremendously conventionalized bows, and are adorned with repetitions of the fringed tab element. In short, this figure, besides presenting several very close resemblances to the Weeping God of Tiahuanaco in its details, resembles it in more general terms also. We find in the Tiahuanaco figure a strong tendency toward bilateral symmetry, a symmetry which is fully attained in this coast figure. More than that, we observe that the two have another significant characteristic in common, namely, the constant re-statement of minor decorative elements (such as the fringed tab). These resemblances are extremely significant.

So much, then, for Tiahuanaco II designs on the pottery of the coast. The material relating to Tiahuanaco II designs in coast textiles is no less ample, and the evidence it presents points just the same way as that offered by the pottery. We will, therefore, consider only one example of Tiahuanaco II coast textile-design. It is shown by Reiss and Stübel, vol. II, Plate 49. It is a rich garment from Ancon. There are two variations either of the Weeping God himself or of the two types of minor figures on the monolithic gateway. We will enumerate the analogies between this design and other arts that we have examined. One of the two variations has: (1) A human face and a head-dress suggestive of the first type of minor figure on the monolithic gateway (i. e. human face with bird body); (2) Tears and tear-lines; (3) Four-digit hands; (4) Two staves; (5)
Fluted (on pottery is mouth wherein, brown, monolithic in other four. The will is richest motif also; symmetrical vestige the in Titicaca, having manifested in another part of the highlands. Before doing so, however, we will mention in passing the fact that save for a vestige here and there Tiahuanaco II art does not appear prominently in the Cuzco region. One exception to this rule is a pottery vessel adorned with an anthropomorphic puma having four digits, fangs and tab-like head ornaments. Its provenance is Cuzco, and it is shown by Seler.\(^\text{16}\)

It is the Tiahuanaco II art at Chavin de Huantar, however, that claims the major part of our attention.

The chief example of ancient art at Chavin is the famous greater Chavin monolith. This wonderful piece of stone-carving is in the Museo Nacional at Lima. It is about six feet long and two broad.\(^\text{17}\) Probably no other single artifact from Peru helps more than this in the study of the relations between Proto-

\(^\text{16}\) Seler, 1893, Plate VII, Fig. 8.

\(^\text{17}\) The writer has seen and examined the original stone. Both Sir Clements Markham and Mr. Joyce are mistaken in thinking the stone to be twenty-five feet long. Markham, 1912, p. 34; Joyce, 1912, p. 176.
Chimu, Proto-Nasca and Tiahuanaco II arts. Several able studies of the stone have appeared, chief among which are two by Markham and that by Polo. With the aid of our Plate IX we will now examine this stone and its bearing upon our subject.

The characteristic of the stone which first strikes the beholder is the tremendous elaboration of the design. One has to study it carefully before it resolves itself into its component parts. When this is done, it becomes apparent that the design falls into halves, the lower of which shows a personage holding two staves, and the upper of which is made up of a mass of inverted faces with their secondary decorations. We will study the halves in that order. The personage is unquestionably derived in part from the Weeping God motif. The face is square and is edged with serpent-heads faintly analogous to the tab-like ornaments of the Weeping God. The face, on the other hand, is utterly different in both content and treatment from that of the Weeping God. Indeed, it is very difficult to decide just which of the numerous complex features belong to the face of the personage. One may assume, if he chooses, that the two upper dots are his eyes and the involutions just above them are conventionalized eyebrows while the two dots below are nostrils. This is, perhaps, the most satisfactory interpretation. The mouth which, from one aspect, looks like an adaptation of the toothed and fanged rectangular mouth seen in coast Tiahuanaco II, again presents difficulties because, on turning the Plate upside down, it turns out that the mouth is formed by two fanged puma-heads set nose to nose and lip to lip. It may be suggested that in the group of details formed by the puma-heads and the twined serpent-heads just behind each of them we see a faint survival and tremendous conventionalization of the mouth-mask of Proto-Nasca art. As in the case of the Weeping God on the monolithic gateway, the body is short and square. There are no

18 Markham, 1904 and 1908; Polo, 1899.
19 Prof. MacCurdy's interpretation of the plate differs from the writer's, for he thinks the two upper dots to be the nostrils of an inverted face like those on the upper half of the stone. There is a good deal to be said in support of this view. But an examination of our Plate IX, or, still better, the large one in Polo, 1899, will show that the writer's interpretation is also valid. We may say, therefore, that the two dots in question serve, in one position, as eyes for the face of the chief head of the design, and, when reversed, act as nostrils for an inverted subsidiary head.
“tears.” There is an area of ornamentation on the breast made up of a new variation of the $\square$ sign edged with feather-like ornaments reminiscent of Proto-Chimu art and Proto-Nasca art. (See Plate I, Figure 3, and Plate III, Figure 3.) This feather-motif occurs many times on the stone. The garment of the personage reminds us of that on the Weeping God of Tiahuanaco in that it is a short skirt-like affair. The puma-heads that adorn the upper edge of the Tiahuanaco figure’s skirt have here become so conventionalized that it is nearly impossible to recognize them. The fringe of human faces on the Tiahuanaco skirt has become mere unadorned rectangles. The arms, it is well to note, are in exactly the same position and much the same in shape both here and on the monolithic gateway. But a marked difference is found in the hands. At Tiahuanaco we found the hands of the Weeping God were fairly close to nature in their modelling despite the fact that they had but four digits. Here, on the other hand, we find a wider departure from realism in the drop to but three digits and in the elaboration of the finger nails into a decorative element. In the two staves we discover a still wider departure from the original theme. The staves are almost exactly alike, which is in itself a significant matter. They have been widened so as to make room for the immensely elaborate ornamentation with which they are encrusted. So complex, in fact, is the overlaid design that it is nearly impossible longer to distinguish any of the features that we perceived in the staves held by the Weeping God of Tiahuanaco. Some may be able to discover in the formalized faces at the base of the two staves a faint echo of the bird-heads that are found at the bottoms of the Tiahuanaco staves.

So much, then, for the lower half of the design on the Chavin stone. In order properly to study the upper half it will be necessary to reverse the Plate. On doing so we find three grotesque faces proceeding from one another’s mouths and each with its tongue protruding and highly decorated. These faces all have fangs, but otherwise they are unlike one another, although the last two from the center do resemble each other closely. The nose of the first face is adorned with a combination of the feather-motif, fang-motif and serpent-head motif. The noses of the other two are much simpler and are marked only by an odd but simple comb-like figure. On each side of the central band of decoration formed by those three faces is a fringe of alternated
serpent-heads and feather-motifs. The tongue of the last head is likewise encrusted with the two.

A word about the general features of this, the greater Chavin stone, should be said before we go on to compare it with other artifacts. It is a bas-relief of the same technique as the Tiahuanaco frieze. The work is finer because the stone lends itself more readily to the cutter’s tools.

At Chavin is another remarkable stone carving, the lesser Chavin stone. It is described by Polo and by Enock. It was found in an underground chamber; indeed, according to Enock, much of the work and many of the chambers in the “castle of Chavin” are subterranean. This feature is reminiscent of Tiahuanaco itself. The lesser stone is at once similar to and different from the greater. The chief points of likeness are the profuse use of fangs and serpents as decorative motifs, and the constant re-statement of these motifs recalls not only the greater Chavin stone, but also the monolithic gateway. The differences are chiefly these: lack of any trace of comprehensible composition, lack of bilateral symmetry and considerable modification of technique.

As our description has proceeded we have made occasional references to resemblances between the Chavin stones and other objects. It will now be our task to systematize these resemblances. Each of the elements which constitute the resemblances will be found in the following table in its appropriate column:

**Affiliations Between Chavin and Other Arts.**

<table>
<thead>
<tr>
<th>PROTO-CHIMU</th>
<th>PROTO-NASCA</th>
<th>TIAHUANACO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fangs</td>
<td>Feathers</td>
<td>Puma-heads</td>
</tr>
<tr>
<td>Feathers</td>
<td>Multiple inverted heads.</td>
<td>Staves</td>
</tr>
<tr>
<td>Staves</td>
<td>Symmetry</td>
<td>Too few digits</td>
</tr>
<tr>
<td>Mouth mask (?)</td>
<td>Skirt</td>
<td>Repetition of motifs</td>
</tr>
<tr>
<td>Too few digits</td>
<td>sign</td>
<td>in many parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of the design.</td>
</tr>
</tbody>
</table>

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20 Enock, 1907, p. 72 ff.; and Polo, 1899.
The table makes clear, perhaps, the three-fold source of the art found in the Chavin stones. We now find ourselves brought to the important question of the historic, artistic and ethnic relations between the three great arts we have studied.

3. RELATIONS BETWEEN PROTO-CHIMU, PROTO-NASCA AND TIAHUANACO II.

We have now studied three ancient Peruvian cultures. It is obvious that, from both the artistic and the archaeological points of view, they form a group. We must now endeavor to answer the question, How are these cultures connected?

Already we have pointed out the basic similarity in subject matter of Proto-Chimu and Proto-Nasca. From one of those cultures the other in all probability was derived. But which was the elder is only revealed by minute analysis. In the Proto-Chimu we find an art which is of a distinctly advanced nature. It has, so far as we know, no introductory manifestations, cruder in type than itself in its own locality. Inasmuch as advanced arts do not suddenly spring into being from nothingness, it can only be supposed that Proto-Chimu art was introduced into the region with which we associate it from some other region. The same may be said of the Proto-Nasca art. Uhle and Joyce seem to incline to the belief that this art is the elder of the two, and Uhle believes it to have had an origin in the north, perhaps in Middle America.\(^\text{21}\)

Let us see, then, if Proto-Nasca can really be justly considered older than Proto-Chimu. In doing this we must first determine from what area or areas it could have been derived (assuming that it \textit{was} derived from some source outside of the Andean area). A rapid survey of the whole field of American civilizations assures us that only from one area could such cultures as the Proto-Nasca and Proto-Chimu have been derived—Middle America. There is much evidence that seems to point toward all the South American cultures as having been derived from the region to the north, but unfortunately this is not the place to examine that evidence. We will assume, therefore, that if, as seems probable, the Proto-Nasca and Proto-Chimu cultures \textit{were}

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the result of a cultural migration, that migration must have had its origin in Middle America. From a geographical standpoint, then, it would be difficult to explain why the migrants, on their way south, passed the region of Chimú and went first to that of Nasca where they developed the Proto-Nasca art after their arrival, and then gradually spread north along the coast, in time reaching Chimú where the Proto-Chimú culture was perfected. This theory is almost impossible to support on geographical grounds. But geographical objections are not the only ones. Other and more serious drawbacks to the theory present themselves.

These drawbacks we will now enumerate. In Proto-Chimú art we have a realistic art which has so thoroughly outlived the preparatory stages characteristic of all arts that there is hardly a trace left of the crudenesses that mark the infancy of all sub-civilized or high primitive arts.\textsuperscript{22} It is a decorative art that has reached so high a level as to combine no small degree of representation with its decorative purpose. In other words, Proto-Chimú art is one ripe for the influence of several principles of art-development. These principles all find their natural resultant in Proto-Nasca art.

A few quotations from Dr. Spinden's work, "A Study of Maya Art," will make clear this point. The mere fact that Dr. Spinden is speaking of Middle American art does not alter the fact that what he says applies equally well to Peruvian art or to any other art of similar rank.\textsuperscript{23}

"In the imaginative modification of any given natural figure, for the purposes of decorative art, there are a number of rather definite processes. Each of these is amenable to the fundamental principles of design, such as balance, rhythm and harmony, as these terms have been elucidated by Dr. Ross.\textsuperscript{24} Each process may show, moreover, the phases of conscious and unconscious manipulation of the subject matter. Lastly, these processes of intensive development of a design motive, . . . . work both singly and in combination. It is possible to detect much of the counterplay."

\textsuperscript{22} The general remarks made here are intended to apply solely to decorative, as contrasted with representative, art.

\textsuperscript{23} Spinden, 1913, p. 38 ff.

\textsuperscript{24} Ross, 1901, 1907.
"The processes are: 1. Simplification. 2. Elaboration. 3. Elimination. 4. Substitution.

Careful analysis of one group of designs after another, during which special attention is paid to the changes in homologous parts, makes pretty clear the matter in which the imagination works. In the first place, imagination does not create, it merely reshapes and recombines, taking suggestions and material from any thing lying within the field of experience.

"Simplification. . . . Dr. Harrison Allen discusses the relations between natural forms and art forms. He finds that the tendencies of conventional art are:

1st, to repeat the normal lines of the model;
2nd, to diminish the normal lines of the model;
3rd, to modify according to a symbol;
4th, to modify according to mystic or religious ideas.

"Elaboration. Of less real worth in the development of art, but of more common occurrence, is the process of elaboration. This process amplifies rather than reduces and by means of adventitious ornament renders the original form more complex.

"Elimination. Elimination of one feature after another of a natural motive till only one or two survive is a common phenomenon the world over in decorative art. In Maya art the process is frequently observed in the case of the serpent. Very often the entire lower jaw is omitted.

"Substitution. The process of substitution likewise plays a great part in all highly developed art, whether barbaric or civilized. The substitution of new and striking details for old and commonplace ones—even at the cost of the first meaning of the design—is one of the simplest and most natural ways by which imagination can reconstruct and revivify worn-out subjects. . . . Especially in decorative art, details of a composition realistic or geometric may be progressively replaced by other quite different details until in the end only a trace of the original setting remains." 25

Let us now seek carefully to apply the principles outlined by Dr. Spinden to Proto-Chimu, Proto-Nasca and Tiahuanaco II arts. We will take up the principles in order. We find, in the transition from Proto-Chimu to Proto-Nasca and to Tiahuanaco II (at Tiahuanaco, on the coast, and at Chavin), that an important part is played by the second aspect of Simplification. We have in Proto-Chimu a highly realistic decorative art in which both modelling and painting seek to approach as nearly

25 Cf. Allen, 1881; Batchelder, 1910; MacCurdy, 1911, 127.
as possible to the outlines of natural models. The outcome of 
this seeking is skillful modelling and the correct number of such 
parts as fingers and toes. In Proto-Nasca art, on the other 
hand, the principle of simplification finds reaction in the diminishing 
of the tendency toward modelled representation and of the 
habit of carefully representing the correct number of fingers and 
toes. The result is a simplification of the form of the vessels 
and of the outlines of the hands at the expense of truth. The 
principle of simplification makes itself still more felt in the transition 
from Proto-Nasca to Tiahuanaco II. In the former it 
had only begun to make itself apparent; modelling, of a simplified sort, to be sure, still survived, as did also five-fingered hands. 
In Tiahuanaco II, however, pottery with modelled forms of men 
or animals is more rare, though modelling in stone is still found, 
probably on account of the influence of Tiahuanaco I. But five-
fingered hands are here in the minority to a decided degree. Simplification has caused the vanishing of realistic hands from 
the decoration on the monolithic gateway. The status remains 
the same in coast Tiahuanaco II. In the greater Chavin stone, 
however, we find the last result of the influence of the principle 
of simplification. In this stone the modelling is at its lowest ebb, and the hands, with but three digits here, have lost nearly 
all semblance to reality, and have become mere elements in the 
scheme of decoration. Thus we see that simplification leads us, 
step by step, down the line of the arts of this period—Proto-
Chimu, Proto-Nasca, Tiahuanaco II—in the order named, with 
the Chavin stone as the culmination of its influence.

Let us now find out what application the principle of Elaboration has to these arts. In Proto-Chimu we found that fangs, 
eye-painting, animal-masks, animal-disguises and other similar 
features were represented. Each of these is acted upon by the 
principle of elaboration. Fangs, it is true, are not a prominent 
element of Proto-Nasca art. But they appear with great prominence in Tiahuanaco art, both of the mountains and of the coast, 
and on the Chavin stones they often form an element of decoration 
of the highest importance. Eye-painting, animal-masks and 
animal-disguises all survive in Proto-Nasca art and are all more elaborate there than in Proto-Chimu. So much so, in fact, that 
their development can go but little further, and they almost disappear in Tiahuanaco II art. It may be suggested, however,
that eye-painting is elaborated into the tears and tear-lines of Tiahuanaco II art while masking finds a faint elaborate revival in the puma-heads at the mouth of the chief figure on the larger Chavin stone. To show one more manifestation of the influence of elaboration we will mention the "Multiple-headed God" motif of Proto-Nasca art. The God is always distinguished by the manner in which his subsidiary inverted heads proceed from one another's mouths and by the presence of feather-like secondary ornaments. Elaboration results in the multiple-headed figure on the larger Chavin stone. That figure, like its Proto-Nasca prototype, has several inverted heads proceeding from one another's mouths and it is marked by elaborate secondary decoration in the form of feather-like ornaments. We must note here that as nothing of the sort is to be observed at Tiahuanaco the transmission from Proto-Nasca to Chavin must have been direct, and that the two were at least partly contemporary. Likewise, as we have pointed out, there are a number of Proto-Chimu elements found on the Chavin stone. One more evidence of the influence of elaboration should not be ignored. That is the contrast between the staffs found in Proto-Nasca with those in Tiahuanaco II and, above all, in Chavin. The contrast needs no comments, save that here, again, the culmination of the process is found at Chavin.

Nor do we lack for signs of the presence of influences on the part of the principle of Elimination. As we have noted, the Proto-Chimu art shows full realistic representation of the whole of men and animals. Between Proto-Chimu and Proto-Nasca we find an elimination of most of the body parts by the latter art. In Tiahuanaco II, however, again probably on account of the influence of Tiahuanaco I, the habit of showing the body is revived, but some of the lines and curves of nature are markedly absent, both in Tiahuanaco II art proper and at Chavin.

Finally, the principle of Substitution is readily seen to have been at work. The eye-painting of Proto-Chimu and Proto-Nasca is substituted by the tears and tear-lines of Tiahuanaco II. The puma-head and ribbon-and-stone-ring tabs on the Weeping God's headdress at Tiahuanaco are replaced by the serpent-heads that occupy analogous places on the larger Chavin stone as well as on the lesser one. Again, the fish-like breast ornament of the Tiahuanaco figure finds a substitute at Chavin in the conventional
breast ornament of the figure on the larger stone. Once more the culmination of the process is at Chavin. Indeed, in the lesser Chavin stone one may see an excellent example of what Mac-Curdy describes as "transposition." It is to be observed in the breaking up of the hitherto harmonious and comprehensible design into a chaotic mêlée of component parts and ill-assorted decorative motifs. One would be but reasonable in thinking the lesser Chavin stone to represent the art-stream, which we have watched so long, at its vanishing point.

Such, then, in very broad outline, is the general trend of the evidence afforded by a study of the application of the four great principles to Proto-Chimu, Proto-Nasca and Tiahuanaco II art. We must now endeavor to interpret the evidence in terms of probable cultural migration. There is not space here to go into a detailed comparative analysis of the minor decorative motifs in Middle American and South American cultures, but the writer is convinced by careful study that the evidence of such an analysis would not differ from that afforded by the broader lines of modification.

To sum up the whole matter briefly, we find that a series of closely related arts is associated in turn with Chimu, Nasca, Tiahuanaco (mountains and coast) and Chavin. We find the art a little older step by step as we go from one of these regions

26 MacCurdy, 1911, p. 127.
27 One piece of pottery, reported on by Uhle (1913b, p. 363), almost constitutes in and of itself a proof of the blending or fusion of Proto-Nasca art into Tiahuanaco II art. The vessel in question is a shallow bowl from Tiahuanaco. On the broad rim is painted, in easily recognizable Proto-Nasca style, a serpent, the head of which is strikingly like the puma heads so often found in Tiahuanaco II art. The fact that the vessel comes from Tiahuanaco proves that Proto-Nasca art was carried thither, and the association of it with Tiahuanaco II art on the same vessel proves their close relationship.
28 The reader's attention is here called to the art of Chiriquí. In many ways strikingly similar both in form and in content to the three early Peruvian arts, the art of Chiriquí is also similar to them in the matter of its development toward conventionalism from realism. It may well be that some day a close connection will be proved between the earliest (realistic) forms of Chiriquí art and the earliest (realistic) forms of Peruvian art. The reader is urged to consult the following works: MacCurdy, 1906, 1911, pp. 127 ff., 1913; Holmes, 1885, 1887; Joyce, 1916, pp. 144 ff.
to the next, a little older, that is, in point of development; the age in point of time from our own day decreases as we go up the series of sites. This does not mean, however, that one site was abandoned before the next began to flourish. In fact, the evidence proves that the first and last steps have much in common, and that they must have been at least partly contemporary. The opinion of the writer is that one should conceive of the slowly ageing art as the result of a slow spread of related peoples in several directions during a long time. While the spread was going on new sites were founded and new phases of the common art-ideal developed, but neither the old settlements nor the old phases of art were thereby at once robbed of vigor. What the political status of these people was we shall never know. We must remain content with what evidence we can wring from the vestiges of their culture.

4. A CRITICAL ANALYSIS OF THE EPIGONAL AND RED-WHITE-BLACK CULTURES.

So far, we have studied three cultures which we have just seen to be intimately linked together by lines of cultural descent. We have hitherto considered a cultural series that spread from the coast to the mountains. We have now come to a fork in that stream.

It is clear from the evidence presented by the architectural remains and by the artifacts that the three cultures so far considered were of a high order. What brought the last of them, the Tiahuanaco II culture, to a close we can but guess at this distant date. It is clear enough, however, that at the end of the Tiahuanaco II period something happened which checked the development of civilization in both mountains and coast. Vague whispers of the cataclysm persisted in the folklore of the country down to Spanish, and even into our own, times. The early chroniclers report the traditions of the event in various ways, none of which needs to be particularized here. In the nature of the case, the character of the catastrophe must have been gigantic in order to bring about the far-reaching results that it did. Whether it was a terrible earthquake, an invasion of savage peoples or some great epidemic of disease or a combination of these things we cannot tell. We only know that in
the Titicaca drainage the result was a sudden and very marked lowering of the culture-level, while on the coast and in other regions remote from Lake Titicaca the subsidence in culture, though noticeable, was not so marked. One more thing seems to be disclosed by known facts. As we have seen, Tiahuanaco II art spread far from Tiahuanaco itself. As we shall see, a decadent form of Tiahuanaco II art lingers on around the edges of the old Tiahuanaco "Empire." It is chiefly at Tiahuanaco itself and in the region between Lake Titicaca and Cuzco that the drop in culture is most noticeable. This would seem to indicate that the cataclysm, whatever it was, took place in the mountain regions. The divergence in culture-level that thus sprang up between the mountain regions and the coast resulted in a wide breach between the later arts of the two regions.20

The cultures which we are to consider in this section are both coast cultures. The "Epigonal" art is mainly identified with the southern parts of the coast—Pachacamac, Nasca and Ica—where the influence of the Tiahuanaco II period had been strongest. Uhle is the scientist to whom the most credit for

20 The author thinks that it is only fair to warn his reader here that the explanation offered to account for the marked lack of connection between Tiahuanaco II art and Inca art is open to a number of objections. In the first place, if Tiahuanaco II influence did spread into the Cuzco region, it must inevitably have left its stamp upon the art of that region. Archaeology does not permit us to deny that Tiahuanaco II art did spread to Cuzco—and far beyond it. Why, then, is there so little of Tiahuanaco influence in Cuzco or Inca art? Why is there not at Cuzco, as at Titicaca, Koati and Tiahuanaco, an intermediate type of art which, though much lower in grade than Tiahuanaco II art, still preserves some vestiges of the old tradition? If the forces that brought the Tiahuanaco II art in the Titicaca drainage to an end were unable completely to obliterate the older style of that region, why were they so much stronger at Cuzco than at Tiahuanaco that they were able to wipe out completely the older art? An answer to these three questions, which were suggested by Dr. Roland B. Dixon, may perhaps be found in the study of the distribution in Peru of the type of culture represented by the Colla-Chulpa type. An examination of this distribution shows that Colla-Chulpa culture, or something very like it, is found throughout the Peruvian highlands from Bolivia to Cuelap in Chachapoyas. It is not like the coast cultures of the time (that is, the period just before the rise of the Incas). Place-names, it is true, have a character remotely suggestive of the coast, but this may have been the result of Inca mitimacs (transferred colonies).
the study of this period should be given, and the reader is urged to examine some of his Plates. When we compare Tiahuanaco II art with “Epigonal” we at once see wherein the difference lies. The latter is but an unskillful and decadent attempt to continue the traditions of the former. Again and again it is possible to recognize portions of well-remembered Tiahuanaco II motifs on “Epigonal” artifacts, but always the latter are far inferior to their prototype in both line and color. So close is the resemblance sometimes that one would be tempted to say that the “Epigonal” things were indeed made in the Tiahuanaco II period, but by unskilled artists. This, however, is interdicted by the irrefutable stratigraphic evidence. The “Epigonal” wares and textiles occur in later strata than the Tiahuanaco II artifacts. The Weeping God, the puma-heads, the bird-figures and many other Tiahuanaco II motifs occur again in “Epigonal” art.

Closely associated with the “Epigonal” art is another art-type which, for want of a better name, we call red-white-black ware after the colors in which it is painted. This type is associated with the coast from Pachacamac northwards to Trujillo (Chimu) and even beyond; it occurs in the same strata with “Epigonal” at Pachacamac, which proves the approximate contemporaneity of the two. Our Plate XI, Figures 1 and 2, shows two excellent examples of this ware. The originals, in the Peabody Museum, Cambridge, Mass., came from Recuay, northern coast region. The colors are red, white and black. In Figure 1 we see a dragon-like figure that is very distinctive of this site. As Joyce points out, it is very similar to a motif found on some Proto-Chimu vases, and a crude derivative of it appears in northwestern Argentina. In the face that adorns the front of the vessel’s neck we perceive a very strong tinge of Proto-Chimu tradition. The ear-plugs and headdress are both reminiscent of the analogous portions of the vase shown in Plate I, Figure 2. A great deal less skill in modelling is shown, however.

To sum up the features of the “Epigonal” and red-white-black arts, we may say that each flourished in the area in which the

30 Uhle, 1903, Plates V and VI.
31 Joyce, 1912, p. 183.
previous culture from which it derived most of its characteristics had flourished. This explains why "Epigonal" art, which differs from Tiahuanaco II only in its imperfection, thrived in the region where Tiahuanaco II had been at its best, and why red-white-black art, similar in many respects to Proto-Chimu, existed in the same territory as the latter. On the whole, this period was one of stagnation. At any rate, nothing appears to have been done to advance the development of art in Peru.

Of what went on in the mountains during this period we know absolutely nothing. Perhaps the shock caused by the putative cataclysm had been so great as to result in a state of affairs almost verging on savagery. There is a possibility that it was at the beginning of this period that the very low-cultured Urus entered the Titicaca basin. They came from the south.52

5. CRITICAL ANALYSIS OF THE CHIMU AND NASCA CULTURES.

As we have already noted, we know something definite in regard to the political, social and ethnological aspects of the people of this period. It will be our task in the present section to study their art, and in doing so we shall observe several close similarities between this coast-culture and the Proto-Chimu and Proto-Nasca cultures. We can but hope that the close artistic correspondence between the two is a token of social correspondence.

The distinctive ware of the Chimu period is the black ware that comes from the northern half of the coast and from various regions here and there in the highlands. Though the ware in question has a wide distribution, one may generalize by saying that it is especially distinctive of the northern half of the coast.

In Plate XI, Figures 3, 4, 5, and 6, are shown four very good specimens of the type. The originals are all in the Peabody Museum, Cambridge, Mass. Besides the fact that the vessels are made of black clay, another new and distinctive feature presents itself. This is the important part played by bas-relief in the decoration of the vessels. In every case, the technique

is the same square-edged variety that is to be noted in the bas-reliefs on the monolithic gateway. This similarity may or may not be significant. In the case of Figure 5 modelling in the round also plays an important part, and the human head with its large fan-shaped headdress recalls some of the figures of Proto-Chimu art. A further development of this headdress is seen on some of the specimens in the American Museum of Natural History. The development takes the form of the addition of great plume-like ornaments that rise in a curve from the headdress and fall down on both sides of the wearer’s face. In decorations with this motif there is to be observed a very marked residue of the old Tiahuanaco II tendency toward bilateral symmetry, and also a number of other criteria typical of that period. For example, one vessel in the New York collection shows a personage with a perfectly symmetrical plumed helmet who is holding two staves or weapons in his symmetrically arranged four-digit hands. Indeed, four-digit hands are by no means uncommon in this period. It was a tendency inherited from the previous periods. A great many vessels however, like Figure 4, show no such symmetry and lack entirely any seeming resemblance to Tiahuanaco II art. Indeed, the anthropomorphic figure on that flask seems to be in the clutches of a creature more closely resembling the dragon-like animal we noticed in connection with the red-white-black ware than anything else. Again, there is a large class of black ware vessels like Figures 3 and 6 totally devoid of either anthropomorphic or zoomorphic decoration.

If skill in modelling is one of the strong points of Proto-Chimu art, it is so of Chinu art as well. Evidence of this is given by the large class of “portraits” in both black ware and in red ware. Above all, the modelled vessels representing peanuts, potatoes, guanacates, squash, paltas, and other vegetables and fruits are especially eloquent of the high artistic capabilities of the potters in the Chimú period. These vessels are adorned with modelled forms which, except in the matter of color, are absolutely true to nature.

All this does not mean to imply that the Chimú people used solely this black clay for their vessels. The black is emphasized merely because it is the most predominant and characteristic. Red clay painted in white slip was used, but it lacked the excel-
lence and the diversity, as well as some of the distinguishing motifs, of the Proto-Chimu pottery. As we have said, "portraits" continued to be produced in this period, and we find them in both black ware and red. It is often difficult definitely to assign a "portrait" to one or the other of the two possible periods.

Still other striking products of this period were the textiles and the stucco wall-decorations derived from them. In Plate XII, Figures 1 and 2, we see reproductions of textiles of this period. Brighter colored cloths with animal and human figures combined with conventional ones were also fairly common. There is, however, nothing especially new about them, and we would better take up the very remarkable architectural achievements of the period. Only by referring to Rivero and von Tschudi and to Squier can one get a really adequate view of the wonderful city of the Chimu kings.33 Great walls thirty feet in height and ten feet thick at base by five feet thick near the top are distinguishing features of one type of ruins of the Chimu period. Another type does not have a tapering cross-section. Adobe is the usual material, of course, and it was one which lent itself admirably to the construction of a huge city of dwellings, canals, reservoirs, gardens and palaces. The interior surfaces of some of the walls are decorated with arabesques in stucco which arouse hearty admiration in the beholder. Squier gives numerous pictures of the various specimens of arabesque. We will content ourselves with noting three main classes of arabesque. The simplest type is that of the three specimens shown by Squier (1877, p. 154 f.), as consisting of lozenge-shaped depressions, or square ones, let into the surface of the wall in such a way as to form a lattice or checker-board pattern. In the same class, but a bit more elaborate, is the design which consists of a raised pattern in the form of a double line of stair-sign design.34 The second type, while still largely geometric, is obviously derived directly from textiles of the type shown in Plate XII, Figure 1. The technique, as in the case of the simplest type, is of the square-edged variety.35 It combines, like the textile-type with which it is related, a mingling

33 Rivero y von Tschudi, 1851, pp. 268 ff.; Squier, 1877, pp. 135-192.
34 Cf. Middendorf, 1894-95, II, pp. 375 ff.
35 Squier, 1877, p. 137.
of geometric with zoomorphic elements. The third and final type might be described as curvilinear on account of the predominance of curved lines. In this type zoomorphic and anthropomorphic elements play a very important part. One decoration of this final type seems to be of a simpler nature than one other. It is made up of a series of large hollow squares in stucco relief. Below them are some extraordinary figures resembling conventionalized tapirs. These figures have their "probosces" down and their "legs" to the observer's right with their arched "backs" on the left. There are two of them under each square.\textsuperscript{36} One is at a loss to explain this combination of motifs and likewise the motifs themselves. More comprehensible is the other specimen of this type. It is distinguished by a very rich composition (still in the square-edged technique) made up of conventionalized men, birds, fishes, crabs, lobsters and other such things. It is plainly the work of a people who were closely in contact with the sea. Two things are very interesting in connection with the human figures, namely, that they wear precisely the same headdress as the figures already described as occurring on the pottery of this period, and that, like those figures, they have less than the real number of digits. The crabs and lobsters in the design are almost life-like. Interwoven with these elements is another one which is like nothing else in Peruvian art. It is a curving device not unlike a W on which are shown some of the animals referred to. The reader is urged to turn to Plate XVI in Joyce (1912) for an adequate presentation of this remarkable design.

To sum up, then, our impressions of Chimu art, we will say that it bears a general and marked resemblance to the Proto-Chimu, both in the subject-matter and in the treatment. As is only natural, there are accretions from the intervening arts, new motifs and a new tendency to use dark-colored clay for vessels. Likewise, it is not difficult to see in the remarkable wall-decorations of this period an attempt to continue the tradition of richly carved ornament found to be so prominent in Tiahuanaco II art. The choice of material—stucco—is easy to explain on the ground that the coast people were already used to stucco as a wall-coating and that suitable stone for the purpose of carving into bas-reliefs was scarce on the coast.

\textsuperscript{36} See Squier, 1877, p. 154.
Let us now turn to a brief examination of the same period further down the coast, designated by the name of Nasca. The reader is urged to consult Uhle, 1913b. The tradition of rich coloring noticed hitherto in the southern coast-region did not die out with the Tiahuanaco period. As we have already seen, the Epigonal period carried on the forms of Tiahuanaco art to the point where they were on the verge of falling to pieces as the direct result of too-long repetition. The last pre-Inca period of the southern coast exhibits an art which derives its color from both the Proto-Nasca and the Tiahuanaco periods and which still preserves a few of the motifs that mark the latter art. Look, for example, at Plate X, Figure 9 of Uhle, 1913b. On the vessel there shown the reader will notice a bird-figure which is considerably like the bird-figures in Tiahuanaco art or in Epigonal. All the other motifs on the vessel, however, are new, and they are distinctive of the period we are now studying. At the same time, the matter of pottery forms is an interesting one. Besides the more usual bowls and dishes, Nasca art shows a new pottery form, namely, the large globular vessel with a fairly wide flaring neck. In most cases, it should be noted, the body of the vessel has a slight tendency to be oval rather than spherical. In the Inca period this tendency becomes emphatic, in the Nasca region, as we shall see. The textiles of this period are practically all adorned with geometric designs. Our old friend the "stair-sign" is a motif that is often found. Color in the textiles becomes duller.

To sum up the period just before the Inca period on the coast in one sentence we may say that the northern half of the littoral preserved the old tendency toward modelled forms in pottery and toward animal forms in textile-designs, and, at the same time, that the southern half of the coast continued to make many-colored pottery although both the pottery and the textiles show a preponderance of geometric forms over life forms. In both parts of the coast it was essentially a period in which creative forces of the race's imagination were at a low ebb. This may be indicative of the state of affairs in other branches of human activity at that time. The old culture of Tiahuanaco had died away from some shock at the centre and the communities on the coast that had been dependent on it for artistic stimulation fell into a period of stagnation which was only brought to a close by the Inca invasion.
6. A CRITICAL ANALYSIS OF LATE INCA OR CUZCO ART.

In Inca art we come to the last phase of aboriginal art in Peru, Ecuador, Bolivia, Chile and Argentina. As the type from which all variants of the Inca types were derived was peculiar to Cuzco and its region, we will examine the art of that district before tracing its spread over the wide area it eventually covered. As we have noted before, the collection of pottery and other artifacts made by the various Yale Peruvian Expeditions in the Cuzco region is the most representative collection of Cuzco pottery now in this country. The articles by Dr. Bingham show excellently well the nature of the site in which most of these things were found. Important also for our purposes, is the recent publication by Dr. Eaton. The evidence presented by him proves conclusively that most of the burials at Machu Picchu are relatively recent, probably dating not farther back than sixty or eighty years before the Conquest. Since this is so, we must assume that the artifacts from there are also recent. None have been found that are pre-Inca.

Besides the Yale collection, that in Berlin and that of Dr. Caparo Muñiz at Cuzco are the best two. It will be well to note that the late Inca period which we are now to discuss includes the reigns of the last three unmolested Incas: Pachacutec, Tupac Yupanqui and Huayna Capac. The period began, probably, somewhat after 1400. When Inca Pachacutec assumed the red fringe of sovereignty the Inca dominion already included most of the territory between Chincha and Huánuco on the north and Arica and Tucuman on the south. It was extended by Pachacutec and his successors so as to include all the territory between the northern part of the modern Ecuador and the River Maule in Chile and between the ocean and the montaña or forest-region. In the last days just before the Spanish conquest, when the ill-fated Atahualpa was Inca, Quito, Cajamarca, Cuzco and the island of Titicaca were the chief centres of importance. Cuzco still remained the capital.

38 Eaton, 1916.
39 Seler, 1893.
40 Cf. Means, 1917; Pedro Sancho, 1840.
We will first discuss the matter of forms in Cuzco (i.e., Inca) pottery before taking up that of decorative motifs. First comes the stately aryballus, at once the most typical Cuzco form and the most universally adopted one wherever Inca power penetrated. Our Plate XIII shows two good examples of this type. There are several sub-types of aryballi. A tentative classification is to be offered later. Next in order of frequency of occurrence come the beaker type, shown in Plate XV, Figure 2, the pelike type, Plate XIV, Figure 1, the bowl, dish and numerous other forms.

In the matter of decoration we find that the geometric figures are in a large majority over anthropomorphic or zoomorphic ones. At the same time, modelled ornament, save for the universal cat's-head nubbin, is found to be essentially foreign to Inca pottery. It does occur, of course, but it is an extraneous element. (Plate XIV, Figure 3; Plate XV, Figures 3 and 4.) By far the greater part of Inca pottery decorations are made up of combinations of a comparatively small number of motifs. We will describe several of these. One of the most widespread is that seen in Plate XIII, Figure 1. An old Indian at Cuzco told the writer that the design represented a conventionalized quipu or knot-record and that the design was applied particularly to the vessels of the quipucamayoc who looked after the quipus. Without accepting this as an absolute fact, we will call this design the "quipu-motif." Another frequently seen motif is the meander (Plate XIII, Figure 2). A third is the lines-and-cross motif (Plate XIV, Figure 1). A fourth we will call the "diamond motif" (Plate XIV, Figure 3). A fifth might be described as the "saw-tooth motif" (Plate XIV, Figure 3). There are numerous other motifs that might be enumerated if space permitted, but the five named are the commonest and one rarely finds a vessel of Inca type that has not at least one of them upon it. In regard to color the Inca or Cuzco type is rather sombre. Black, dark brown, light brown, red and some white are the usual tints.

Cuzco types tend to vary but little from the original model. Nevertheless, local variations do occur in several regions, and in the Inca pottery at Cuzco itself marked influences from the arts of subjugated peoples are to be seen. We shall take up
in turn our consideration of these departures from the usual type.

It may be said that the Inca dominion spread first south then north. The Inca artifacts found in northern sites are, on that account, likely to be more recent than those found in the southern sites. In Argentina and Chile Inca vessels are frequently met with. Boman (1908, I, Plate X) shows two aryballi from Lapaya in north-western Argentina. The shape of the vessels and the arrangement of handles and nubbins are exactly the same as in vessels from Cuzco or Machu Picchu. The pattern on the better of the two pots is divided into two motifs which are the “diamond motif” in two forms, and a debased form of the “saw-tooth motif.” Boman’s Plates XI and XIV (vol. I) show other Cuzco-type vessels from Lapaya which do not call for special mention. His Plate XVIII (vol. I) shows two aryballi from the Argentine site of Lerma. One shows the “saw-tooth motif” and the “diamond motif.” The other combines a perfect Cuzco shape with a well-modelled snake whose head is near the neck of the vessel and slightly raised as if to strike. In general, then, these designs, though obviously derived directly from Cuzco prototypes and totally unrelated to any other Peruvian art, are marred in some cases by a crudeness and uncertainty of execution that may, perhaps, be attributed to a lack of skill on the part of local makers. An examination of Cuzco pottery from Chilean sites reveals a similar situation. Oyarzún (1910, p. 363 ff.) shows six Inca or Cuzco aryballi from places in northern Chile. In three cases both shape and decoration are of the best Cuzco style, but in the other three the designs, though derived directly from Inca ones, are crude in point of execution. Turning our attention to Ecuadorian sites we find that the state of affairs is much the same as in the far south of the Inca dominion. Dorsey (1901, Plate XLIII) shows a fine Inca aryballus from the island of La Plata in the Bay of Guayaquil. It is exactly of the same shape as the Cuzco of Machu Picchu vessels and it is adorned with the “quipu motif.” Bamps (1879, Plates II, III, and IV) shows many Inca vessels from points further north and east in Ecuador. Again, both in shape and in the execution of the designs, these vessels could not be told apart from similar ones from Cuzco or Machu Picchu. So far as archaeological
work has thus far shown, the potters of the north were more successful in their attempts to copy the Cuzco style than were those of the south. We should bear in mind, however, the likelihood that cruder specimens of vessels of the Inca type have not been reported on. A vessel from Ibarra, Ecuador, is noteworthy in this connection. It is shown by Seler (1893, Plate 48, Figure 20). It is an aryballus, but the graceful shape of the prototype is not preserved in this copy; the flowing line that, in the Cuzco vessels, merges the neck with the body is here broken by a pronounced shoulder. The decoration, however, combines the "quipu motif" with the "diamond motif."

It may seem odd at first that the widest divergences from the Cuzco standard do not occur in the regions furthest from Cuzco. Pachacamac and Ica are the two sites which show the most strongly localized arts. The reader is urged to consult Uhle's publications on this point.41 In the period that preceded the Inca period at Pachacamac, as we have seen, the people made a great number of black clay vessels with one-handled globular bodies and necks adorned with rather coarsely modelled human faces. The combination of this art with Inca vessels of the aryballus type resulted at Pachacamac in giving two handles to the vessels and in adding paint to the modelled face. We should not fail to note that in many cases where the hands appear in the Inca vessels they have five fingers. This emphasizes the breaking away from the old Tiahuanacaco tradition. At Ica, as we have previously observed, large vessels of a slightly oval shape were made in the last pre-Inca period. These develop into a definitely egg-shaped or cask-shaped type decorated sometimes with Inca motifs and sometimes with Nasca motifs.

This brings us to the consideration of the other type of variation from the Cuzco standard. It is the class of variation which consists in a manifestation of the influence of local pre-Inca arts on the Cuzco type. The reader has just seen the effect that Inca art had upon the modelled black ware of the coast. He is now asked to turn his attention to its corollary, the type which shows the influence of the black ware of the coast upon the Cuzco types. In Plate XV, Figure 4, we have an excellent specimen of this class. Though both come from Machu Picchu, Figure 3 may

41 Uhle, 1903, Plates VIII and XIII, 1913b, Plate X.
well be the coast-form which served as a model for the other. In both examples there is but one handle, and the general shape is the same in both. Figure 4, however, is definitely associated with Inca art by the "quipu motif" on its body.

We will now draw up a classification of Inca pottery on a basis of form and decoration:

Type I Large open-necked vessels (often painted with geometric designs).
   a Deep bowls without handles (Seler, 1893, Plate I).
   b Various types with handles gradually approaching aryballus.

Type II Aryballus type. Narrow neck, two handles and nubbin.
   a With geometric designs only.
   b With painted designs both geometric and animal.
   c With modelled anthropomorphic element and painted design in combination.
   d Miscellaneous sub-types.

Type III Plates, bowls, braziers, cups, etc.
   a With geometric designs.
   b With animal or human designs.
   c With both.

Type IV Miscellaneous beakers, bottles and pots.

We must now turn our attention to the question of Inca or Cuzco textiles. To the modern eye they appear the most beautiful of all Peruvian textiles. As we shall see, however, they are not technically so wonderful as the Proto-Nasca embroideries. Plates XVI and XVII show four typical Inca textiles. A glance will show the reader that those on Plate XVI are of a very different type from the other two. They come from the island of Titicaca, and the originals are in the American Museum of Natural History, New York. In Plate XVI it is seen that the decorative tendency is to break the surface up into small patches of color. This same tendency may be remarked on Inca pottery from the same site. The number of decorative motifs is too great to dwell upon at length; we shall have to content ourselves with noting that the motif which consists in a slanting band ended off by two squares each containing a dot, which squares are repeated on each side of the band, occurs on an Inca cloth
Variants of the "saw-tooth motif" and of the "diamond motif" are present in each of these ponchos, recalling the Inca pottery. Both also show the frequent use of rectilinear spirals. Plate XVII, Figure 1, is also a poncho from the island of Titicaca. It is in several shades of red and has a white cruciform figure much like that on the cask-shaped vessel from Ica shown by Uhle (1913b, Plate X, A). Figure 2 comes from the coast and shows a slight influence, in the form of cat-like figures, from the Chimu period.

We must now summarize our impressions of Inca art. We may do so by saying that geometric decoration has a great preponderance over animal or human motifs. While Inca pottery derives most of its charm from its graceful form, it is by no means to be despised because it has not a great range of color. The designs are usually simple but pleasing, and in most cases they are peculiar to Inca art. In the textiles the same tendency toward geometric designs is to be noted, although here again other elements do occasionally play a part. In general, the color of the textiles is brighter and more various than that of the pottery.

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42 Uhle, 1913b, p. 344.
IV. THE QUESTION OF CHRONOLOGY AND DATES IN EARLY PERUVIAN ART

As was said at the beginning of the paper, the writer, after surveying the development of art in ancient Peru, wishes to present a date-chronology of the various cultures. The dates here to be presented are only approximate. In the nature of things, we must be prepared to allow for an error of a century or more in the remoter epochs.

It is necessary that a word should be said as to the methods employed in drawing up the chronology. In the total lack of all written records of any sort we have to meet a great obstacle. This is partly overcome by certain things which we will speak of soon. Moreover, tradition, which sometimes does much to aid in the establishment of an approximate chronology, is here limited almost wholly to the Inca period. These are the chief disadvantages to be met with. We will now examine the conditions which are more favorable to our end.

In trying to construct a date-chronology for the various higher cultures of the Andean region, one must bear in mind that it is inherently improbable that the cultures of South America possess an antiquity greater than those of Middle America. The researches of Dr. Hrdlička have clearly shown this improbability. He has shown four very important truths: (1) Man is zoologically a newcomer in this hemisphere; (2) Man, when he arrived on this continent, was in a stage of culture "superior to that of the late Pleistocene"; (3) Man, since arriving in this hemisphere, has inevitably undergone certain secondary modifications as to physical type and culture; (4) There exists to-day in northeastern Asia a racial element that is descended from the same ancestors as the American Indians.¹

Since, from the point of view of the zoologist, Man is an Old World animal that reached America by way of Siberia and the Aleutian Islands, it must be assumed that the northern parts of the continent were peopled sooner than the southern parts. This supposition applies to any tribes, no matter what their cultural grade may be. Nor is mythology lacking in indications of the

¹ Cf. Hrdlička, 1912, 1912b, 1912c, 1912d.
southwardly shift of the high-cultured people of the west coast of South America. In the face of all this, then, the onus probandi rests upon him who would maintain that the South American populations are older than the North American or Middle American.2

Let us, then, assume for the purposes of the present discussion that Man entered America from the north and slowly spread southward. The primary migrations of Man in America have a southward trend. His secondary migrations often do not. In the Middle American region (Mexico, Yucatan, Guatemala, Honduras, Salvador, Nicaragua, Costa Rica and Panama) we have a number of very high cultures. Those of Mexico and Yucatan are, in many respects, as high or higher than those we have been studying. Up to about 752 A.D. all is vague and uncertain as to cultural events in Mexico. In or about that year, however, the Toltecs founded Tula.3 More important for us is the cultural type described by Tozzer as "archaic." It is much older than the Toltec culture and much more widespread. Indeed, we may say that the archaic type occurs scatteringly from the valley of Mexico down to Panama.4 It will perhaps be proved to be the ancestor of most of the later high cultures of Middle and South America. At any rate, the meager seven centuries from the founding of Tula to the Spanish conquest is obviously not long enough to account for the development and wide distribution of the calendar-system and the various related dialects in Middle America. We must assume that the people of the archaic period flourished long before the time when the earliest high cultures of Middle America began to develop their own peculiarities, peculiarities which, however, never succeeded in blotting out the fact that all the cultures had a common origin.5

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2 This is not the place to go into the question of geologically ancient man in America. Those who wish to do so are urged to read Hrdlička, 1912, and the numerous works listed in the Bibliography of that publication. All that it is necessary to say here is that Hrdlička has shown the extreme unlikelihood of the existence of any of the morphologically primitive types of men in America.


4 Tozzer, 1916, p. 466; Spinden, 1915; see Appendix for discussion of "archaic type."

5 Means, 1917.
In Yucatan we can fairly carry the beginning of protohistory back many centuries. This is largely due to the work of Mr. Bowditch and to that of Mr. Morley. As the present writer has explained elsewhere, the difference between the chronologies of these two authors is neither serious nor great. The earliest dated Maya remains are, respectively, the Tuxtla statuette and the Leyden plate. The former bears the Maya date 8.6.2.4.17 (about 100 B. C.); the date on the latter is 8.14.3.1.12 (about 40 A. D.). In spite of the fact that these inscriptions are so early, the system in which the dates are set down is absolutely the same as that in which those of the "Old Empire" cities in southern Yucatan are written. The significance of this is, of course, that even so early as 100 B. C. the Mayas had gone through the centuries-long process of evolving their calendar system. We must postulate, in Mr. Morley's opinion, at least a thousand years of preparatory development. This period of development should be understood to include the migrations of the various branches of the original stock to the place in which they are found in later eras. From about the time of Christ to the end of the seventh century the "Old Empire" of the Mayas was running its course. From then to the middle of the fifteenth century the "Transitional Period" and "New Empire" rose and fell.

We will now summarize the chronological conditions known to be true of Middle America. For at least eleven centuries before Christ various migrations (mainly southward) were accompanied by the steady development of individual cultures, all variants of a common origin, albeit influenced by environmental and psychological conditions. By the time of Christ, the high cultures of Middle America had almost crystallized into their final forms.

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6 Bowditch, 1901; Morley, 1910, 1915; Means, 1917b, p. 3.
7 While on his most recent expedition for the Carnegie Institution of Washington, Mr. Morley discovered an important site in northern Guatemala. He gave it the name of Uaxactun—Eight-stone—because he found there a large stela bearing the Maya date, 8.14.10.13.15, equal to about 50 A. D. Another inscription at that site may possibly be eighth cycle, also. We have, consequently, at least three inscriptions dating from 50 A. D. or earlier. (Information given by Mr. Morley to the writer.)
In South America, what do we find? We find a series of cultures following one another in logical succession. We find that the earliest are the most like the Middle American cultures. We find, besides, two independent criteria which enable us to build up an approximate chronology. Each will be described in turn.

The list of "kings" of Peru given by Fernando Montesinos on the authority of Blas Valera has only lately begun to receive the attention it merits. While it emphatically cannot be accepted as real history, it is, nevertheless, important as indicating that popular legend in the time of the Incas preserved the memory of many generations of rulers. Counting the Incas, the "kings" on the list number 102. Markham, an accomplished historian in other fields as well as in the Peruvian, considers that 27 years is a fair average for the length of a reign. Accepting this in its totality for the nonce, we find that the list of rulers is thought by Montesinos to cover a period of 2,754 years, or, in other words, that the first ruler flourished about 1224 B. C. (1530 A. D. minus 2,754). This date, then, is the very earliest that even Montesinos is willing to accept. Everyone will agree that this date is hardly tenable. As Markham says (1912, p. 41), we must allow for repetitions, overlappings and other errors. Let us, then, be conservative and consider that there were but seventy reigns. This gives us about 1,900 years as the period covered by the list, and it puts the earliest ruler about 350 B. C. Sir Clements Markham (loc. cit.) prefers the initial date 200 B. C. We may say, then, that in all probability, the earliest "king" of Tiahuanaco I (it was of the mountain races that Montesinos wrote) flourished about 200 B. C. Probably, however, culture was low and local for many generations. We find that the "first dynasty" of Montesinos is frequently marked by the name Pirua. It consists of eighteen rulers. Let us call it fifteen; \(15 \times 27 = 405\) years; or, in other words, the Pirua "dynasty" came to a close about 200 A. D. Was not this perhaps the end of the Tiahuanaco I period? The next "dynasty" is marked by the name Amauta in many cases. Montesinos gives it forty-five rulers. Let us call it thirty; \(30 \times 27 = 810\); this brings us

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\(^5\)Montesinos, 1840, 1882; Markham, 1912, p. 303 ff.
up to about 1000 A.D. This date, however, does not fit well with known historical facts. Let us, then, say that the Amauta "dynasty" (perhaps of Tiahuanaco II) flourished from about 200-900 A.D. Montesinos calls the dark period that followed the Amauta "dynasty" the "Tampu Tocco period." In it we may see our Colla-Chulpa period. He gives it twenty-seven rulers. Let us call it ten; $10 \times 27 = 270$ years; or, to put it differently, the dark period began to draw to a close about 1170 A.D. This brings us to the threshold of the Inca period. The late Dr. Gonzalez de la Rosa constructed a date-chronology of the Inca period which seems to the writer wholly acceptable. A modified version of it is given here.\(^\text{10}\)

Reigns of the Incas, According to Dr. Gonzalez de la Rosa.

<table>
<thead>
<tr>
<th>Period</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinchi Rocca</td>
<td>1134-1197</td>
</tr>
<tr>
<td>Lloque Yupanqui</td>
<td>1197-1246</td>
</tr>
<tr>
<td>Mayta Capac</td>
<td>1246-1276</td>
</tr>
<tr>
<td>Capac Yupanqui</td>
<td>1276-1321</td>
</tr>
<tr>
<td>Inca Rocca</td>
<td>1321-1348</td>
</tr>
<tr>
<td>Yahuar Huaccac</td>
<td>1348-1370</td>
</tr>
<tr>
<td>Viracocha</td>
<td>1370-1425</td>
</tr>
<tr>
<td>Pachacutec</td>
<td>1425-1478</td>
</tr>
<tr>
<td>Tupac Yupanqui</td>
<td>1478-1488</td>
</tr>
<tr>
<td>Huayna Capac</td>
<td>1488-1525</td>
</tr>
</tbody>
</table>

It may be more satisfactory to some to reduce the thing to round numbers, thus: Viracocha, 1370-1420; Pachacutec, 1420-1480; Tupac Yupanqui, 1480-1490; Huayna Capac, 1490-1525. Either step will result in a fairly accurate basis on which to fix one's idea of the reign-periods.

So much, then, for one of our two criteria. It has been noted that this one concerns the mountain region primarily. The other is important for the coast cultures. It is unfortunate that it has not yet been fully studied.

The islands off the coast of Peru have long been famous for their deposits of guano. These lie in masses of enormous thickness. Markham says that two and one-half feet a century is approximately the rate of accumulation. The rate no doubt fluctuated slightly, but the careful investigations made by Mark-

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\(^{10}\) Gonzalez de la Rosa, 1909; Means, 1917, p. 244.
ham have led him to accept the above rate as a fair average. According to Gonzalez de la Rosa, antiquities occur in the guano at depths varying from nine feet to forty or more. This means that in 1870 (at which date the investigations were made) the antiquities presumably varied in age from about four centuries (i.e., 9 feet gives a date of about 1450) to about sixteen centuries (i.e., 40 feet gives a date roughly equal to 200 A.D.). Perhaps future work will yield more detailed information as to which cultures are found at various depths in the guano. At all events, it seems possible that for want of a better criterion we must bear the evidence of the guano deposits in mind.

It is now well for us to summarize and tabulate the general results of the evidence brought out by the foregoing discussion. Once again the reader is asked to remember that the dates here offered claim to be no more than roughly approximate guides to the imagination.

**An Approximate Chronology of the Early Cultures of Peru.**

<table>
<thead>
<tr>
<th>Mountain Regions</th>
<th>Coast Regions</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Migrations</td>
<td>Primary Migrations and Proto-Chimu and Proto-Nasca</td>
<td>?—200 A.D.</td>
</tr>
<tr>
<td>Tiahuanaco I</td>
<td>Coast Tiahuanaco II, followed by “Epigonal” and red-white-black wares</td>
<td>200–900</td>
</tr>
<tr>
<td>Tiahuanaco II</td>
<td>Continuance of above styles</td>
<td>900–1100</td>
</tr>
<tr>
<td>Colla-Chulpa period (called “Tampu Tocco” by Montesinos)</td>
<td>Early Inca</td>
<td>1100–1400</td>
</tr>
<tr>
<td>Early Inca</td>
<td>Late Inca dominion approaching its zenith</td>
<td>1400–1530</td>
</tr>
</tbody>
</table>

11 Gonzalez de la Rosa, 1908.
12 The reader is particularly reminded that there is much evidence to show that Proto-Chimu, Proto-Nasca and Tiahuanaco I all contributed
This brings us to the end of our subject. When, in 1531, the Spanish conquest of Peru began, the Inca dominion—Ttahuanta-tin-suyu—was being torn to pieces by a civil war between the legitimate ruler, Huascar and the usurper Atahualpa. Subsequent evolution in Peruvian Art lies beyond the scope of the present work.

towards the formation of Tiahuanaco II. Moreover, as Tiahuanaco II art grew older it became more and more complex, spreading, at the same time, into regions very far away from Tiahuanaco itself. The fact that the specimens of Tiahuanaco II art from the more distant regions often show the admixture of elements taken over directly and bodily from Proto-Chimu and Proto-Nasca art, shows that, even when Tiahuanaco II was approaching its end, the two early coast arts were still vigorous. The dates on the above table, therefore, should not be regarded as the terminal dates of the culture periods, but as the approximate dates at which each was at its strongest development.
APPENDIX I: THE ARCHAIC TYPE.

Dr. Herbert J. Spinden kindly wrote at the writer's request this summary of his views as to the significance of the "archaic type."

"An archaic culture allied to that of Mexico and Central America seems once to have spread across Colombia and Ecuador to the coast of Peru. In Peru the culture has not been isolated in pure form—if we may use this chemical phrase in archaeology—unless it should prove to be that which Uhle briefly describes from the earliest shell-heap remains at Ancon. He figures several heads that resemble very closely those of the lowermost horizon in Mexico and he finds associated with them pottery characterized by incised and plastic decoration. It need hardly be pointed out that the pottery of the Archaic horizon in the north is also characterized by plastic decoration and that when incised or painted decorations occur the designs are exceedingly simple. Highly "conventional" designs based upon an animal motive are not found in the truly archaic, but are characteristic of the second crop of cultures after religion and ceremony had developed to the point that it could react strongly upon art.

"But in the absence of other data we may be permitted to rest our theory upon the presence in the coastal region of Peru of figurines presumably related to those of the Archaic horizon although found among the products of a later time. At Ancon, and at other sites as well, are found nude female figurines with the short stubby arms that are so characteristic of the products of the Archaic horizon from Mexico to Colombia. These figurines are usually moulded rather than modeled and it seems unlikely that moulds came into use until the upper archaic or even later. The standing pose is more common than the sitting one. In the American Museum collections there are perhaps twenty-five examples of these figurines, and others are reproduced by Putnam."

^ Uhle, 1912, pp. 22-45.
^ Putnam, 1914, Plate XIX.
In addition to female figurines there are many examples of pottery vessels from Ancon, Trujillo, etc., in which a human figure is represented in a fashion that harks back to the archaic, namely with the elbows and knees both flexed and the former directly over the latter. Of course, in the cases of both the figurines and the vessels the qualities peculiar to Peruvian art had already become set.

The theoretical considerations that connect the spread of archaic ceramic art with the spread of agriculture are very strong. No one can get away from the fact that maize, beans and squashes constitute four species (Zea mays, Phaseolus vulgaris, Cucurbita maxima, and C. pepo) wherever agriculture is found in America. The Lima bean (Phaseolus lunatus) had a more restricted use.

It seems not unreasonable to suppose that careful research will bring to light more evidence on the occurrence of figurines of early type. These objects may have been neglected in favor of those of greater artistic interest. For instance, Dorsey, in discussing the finds on the Island of La Plata, says:—

"Practically all this pottery was in fragments, only two pieces were found in perfect condition. With the exception of not more than a dozen pieces, all the fragments were parts of small images in the form of human figures. . . . From fragments representing perhaps a thousand images not more than half a dozen pieces were found which bore any trace of paint. . . . All the pottery, with a very few exceptions, is hand made; that is, it was not made in a mould, which was commonly employed on the mainland of Ecuador and throughout a large extent of Peru."

Many of the fragments figured by Dorsey are distinctly archaic in treatment. Of course it might be argued that the archaism is absolute rather than relative but a comparison of special features gives ample evidence of transitions from one region to the next."

To these remarks by Dr. Spinden the writer would like to add a few of his own.

As has been said, the "archaic type" is stratigraphically the earliest in Middle America. Therefore, if it does occur in South

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America it must be expected to be the earliest there also. If one is to believe that the "archaic type" was a very early type which spread all over the northern half of Latin America, must not one also assume that the various later cultures were developed from it in the several regions involved? Such a development would occur after religion and ceremony had gained considerably in strength, as Dr. Spinden says. On the other hand, if the "archaic type" is looked upon as a cultural landmark rather than as a culture in itself, the finding of it in the wide area mentioned does not prove much. In other words, if we are to believe that all art at some time or other passes through a stage wherein it shows "archaic type" characters, the mere fact that art with archaic characters is found in both Middle America and South America does not mean much. The writer, however, finds that the former interpretation is the better. There can be but little doubt as to the absolute priority in point of time of the archaic culture of the Peruvian shell-heaps. The work of Uhle has shown that in Peru, as in Middle America, the earliest culture of all was the archaic type, and we now know that this type was uniform throughout Middle America and on the Peruvian coast. It is the foundation whereon all other cultures were built.
APPENDIX II.

A TABLE TO SHOW ROUGHLY THE CHRONOLOGICAL ORDER OF THE EARLY PERUVIAN CULTURE PERIODS.

<table>
<thead>
<tr>
<th>Names</th>
<th>Areas</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proto-Chimu.</td>
<td>The coast from Tumbez to Ancon.</td>
<td>Characterized by realism and light tonality.</td>
</tr>
<tr>
<td>Proto-Nasca.</td>
<td>The coast from Pachacamac to Arica.</td>
<td>Distinguished by conventionalization and rich coloring.</td>
</tr>
<tr>
<td>Tiahuanaco I.</td>
<td>In the mountains, from Samaipata to Cuzco, and especially about Lake Titicaca.</td>
<td>A culture rich in architectural remains. Endowed with a stone technique. Not like P-C or P-N, possibly Arawa-kan.</td>
</tr>
<tr>
<td>Tiahuanaco II.</td>
<td>In mountains and on coast, from Colombia to Argentina and Chile.</td>
<td>Probably a complex of the three foregoing cultures.</td>
</tr>
<tr>
<td>&quot;Epigonal&quot; and Red-white-black.</td>
<td>On the Peruvian coast.</td>
<td>Decadent forms of Tiahuanaco II culture.</td>
</tr>
<tr>
<td>Chimu and Nasca.</td>
<td>On the Peruvian coast.</td>
<td>Revival of some of the features of Proto-Chimu and Proto-Nasca.</td>
</tr>
<tr>
<td>Colla-Chulpa.</td>
<td>Around Lake Titicaca.</td>
<td>Low culture with faint traces of Tiahuanaco II influence.</td>
</tr>
<tr>
<td>Inca &quot;Empire.&quot;</td>
<td>From Ancasmayo in Ecuador to Maule in Chile.</td>
<td>The last pre-Columbian culture. Graceful forms, restrained coloring.</td>
</tr>
</tbody>
</table>

--------- Separates contemporaneous cultures.
---- ----- Separates partly contemporaneous cultures.
-------------- Separates non-contemporaneous cultures.
BIBLIOGRAPHY OF WORKS REFERRED TO IN THIS PAPER.

ABBREVIATIONS

AA American Anthropologist.
AASP American Antiquarian Society Proceedings.
AJA American Journal of Archaeology.
AJS American Journal of Science.
AMJ American Museum Journal.
APAMNH Anthropological Papers American Museum of Natural History.
BAE Bureau of American Ethnology.
BGA Berliner Gesellschaft für Anthropologie.
BSGL Boletín de la Sociedad Geográfica de Lima.
BSGLP Boletín de la Sociedad Geográfica de La Paz.
CAAS Connecticut Academy of Arts and Sciences.
CIA Congrès internationale des américanistes. (See also, ICA.)
CIAAP Congrès internationale d'anthropologie et d'archéologie pré-historiques.
FCMP Field Columbian Museum Publications.
FFLSA Facultad de Filosofía y Letras, Sección Antropológica (Buenos Aires).
HS Hakluyt Society.
ICA International Congress of Americanists. (See also, CIA.)
JRGS Journal of the Royal Geographical Society.
MFAB Museum of Fine Arts Bulletin (Boston).
NAMS Nouvelles Archives des Missions Scientifiques.
NGM National Geographic Magazine.
PAAAS Proceedings of the American Academy of Arts and Sciences.
RH Revista Histórica (Lima).
SMP Smithsonian Miscellaneous Publications.
TCCC Trabajo del Cuarto Congreso Científico.
ZE Zeitschrift für Ethnologie.

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Fig. 3. A somewhat grotesque Proto-Chimu vessel of the portrait type. Note the fangs and the feather-like headdress. Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 4. A portrait, probably belonging to the Proto-Chimu culture. Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 5. A dipper-shaped Proto-Chimu vessel adorned by a conventionalized starfish or octopus. Courtesy of the Peabody Museum, Cambridge, Massachusetts.

PLATE II.

Fig. 1. A Proto-Nasca vessel of the semi-realistic type. Note realistic hands and the modelling of the head. Courtesy of the American Museum of Natural History, New York City.

Fig. 2. A Proto-Nasca vessel with some realism, especially in the spears and spear-thrower. Note the eye-painting, and the type of dress. Courtesy of the Peabody Museum, Cambridge, Massachusetts.
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Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 4. A Proto-Nasca vessel with two narrow spouts.
Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 5. A Proto-Nasca vessel decorated with the Multiple-headed God motif. Note the four digit-hands.
Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 6. A semi-realistic modelled vessel, of the Proto-Nasca culture.
Courtesy of the Peabody Museum, Cambridge, Massachusetts.

PLATE III.

Fig. 1. A Proto-Nasca vessel. Note the headdress, the mouth-mask, the ribbon-and-ring decorations, and the conventionalized spear-thrower.
Courtesy of the American Museum of Natural History, New York City.

Fig. 2. A Proto-Nasca vessel with a variant of the Centipede God motif. Note the four-digit hands and the protruding tongue.
Courtesy of the American Museum of Natural History, New York City.

Fig. 3. A Proto-Nasca vessel. Note the feather-like mouth-mask, the ribbon-and-ring decorations, and the bilateral symmetry of the design.
Courtesy of the American Museum of Natural History, New York City.

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Courtesy of the Museum of Fine Arts, Boston, Massachusetts.

Fig. 2. A Proto-Nasca vessel decorated with a variant of the Centipede God motif and with a painted human face. Note the four-digit hands, the protruding tongue and the “tears.”
Courtesy of the American Museum of Natural History, New York City.

Fig. 3. A Proto-Nasca textile. Note the headdress, the mouth-mask, the four-digit hand, and the elaborately decorated protruding tongue.
Courtesy of the American Museum of Natural History, New York City.

PLATE V.
A richly embroidered Proto-Nasca textile. The design combines elements from the Centipede God motif with elements from the Multiple-headed God motif.
Courtesy of Dr. Denman Waldo Ross and of the Museum of Fine Arts, Boston, Massachusetts.

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A large and beautiful embroidered Proto-Nasca garment. Made entirely of wool.
Courtesy of Dr. Denman Waldo Ross and of the Museum of Fine Arts, Boston, Massachusetts.

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Fig. 1. A finely woven garment, probably of the Tiahuanaco II culture.
Courtesy of the American Museum of Natural History, New York City.

Fig. 2. A garment from the coast of Peru, probably of the Tiahuanaco II culture.
Courtesy of Dr. Denman Waldo Ross and of the Museum of Fine Arts, Boston, Massachusetts.

PLATE IX.
The Greater Chavin Stone.
Photograph by courtesy of the Peabody Museum, Cambridge, Massachusetts.

PLATE X.
Two textiles, either late Tiahuanaco II or Epigonal. Note the results of long-continued conventionalization and elaboration.
Courtesy of the American Museum of Natural History, New York City.

PLATE XI.
Fig. 1. A Red-white-black ware vase. Note the headdress, the modelled face and the painted animal-figure.
Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 2. A Red-white-black ware vessel in the form of a cat-like animal.
Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 3. A Black-ware vessel, Chimu culture.
Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 4. A Black-ware flask, Chimu culture.
Courtesy of the Peabody Museum, Cambridge, Massachusetts.

Fig. 5. A Black-ware vessel, Chimu culture.
Courtesy of the Peabody Museum, Cambridge, Massachusetts.
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Fig. 6. A Black-ware flask, Chimú culture. Courtesy of the Peabody Museum, Cambridge, Massachusetts.

PLATE XII.

Fig. 1. A Chimú textile. Note the combination of geometric decoration with greatly conventionalized animal-heads or bird-heads. Courtesy of the American Museum of Natural History, New York City.

Fig. 2. A very fine pouch, Chimú culture. Courtesy of the American Museum of Natural History, New York City.

PLATE XIII.

Fig. 1. An Inca or Cuzco aryballus of exquisite shape, decorated with quipu motif. Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

Fig. 2. An Inca or Cuzco aryballus, decorated with rectilinear meander. Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

PLATE XIV.

Fig. 1. An Inca or Cuzco pelike, decorated with lines-and-cross motif. Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

Fig. 2. A deep bowl with handles, Inca or Cuzco type. Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

Fig. 3. A shallow dish, decorated with saw-tooth motif and with diamond-motif. Note the handle in the form of a human head. Inca or Cuzco type with influence from the art of the coast. Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.
Fig. 4. A shallow dish, Inca or Cuzco type. 
Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

PLATE XV.

Fig. 1. An Inca or Cuzco aryballus. 
Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

Fig. 2. An Inca or Cuzco vessel. 
Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

Fig. 3. A vessel with anthropomorphic decorations. Although the specimen was found at Machu Picchu, it may have been carried there from the coast. It is of the Chimu type, not of the Inca or Cuzco type. 
Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

Fig. 4. A vessel combining Chimu art with Inca or Cuzco art. 
Compare with Figure 3. 
Yale Collection; courtesy of the Connecticut Academy of Arts and Sciences.

PLATE XVI.

Two Inca or Cuzco type ponchos. Very rich in color, and beautifully woven. 
Courtesy of the American Museum of Natural History, New York City.

PLATE XVII.

Two Inca or Cuzco type textiles. 
Courtesy of the American Museum of Natural History, New York City.
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