DUDENEY HENRY ERNEST

THE CANTERBURY PUZZLES, AND OTHER CURIOUS PROBLEMS

Henry Dudeney

The Canterbury Puzzles, and Other Curious Problems

Dudeney H.

The Canterbury Puzzles, and Other Curious Problems /
H. Dudeney — «Public Domain»,

Содержание

PREFACE 5
INTRODUCTION 6
THE CANTERBURY PUZZLES 12
1.—The Reve's Puzzle 13
2.—The Pardoner's Puzzle 14
3.—The Miller's Puzzle 15
4.—The Knight's Puzzle 16
5.—The Wife of Bath's Riddles 17
6.—The Host's Puzzle 18
7.—The Clerk of Oxenford's Puzzle 19
8.—The Tapiser's Puzzle 20
9.—The Carpenter's Puzzle 21
10.—The Puzzle of the Squire's Yeoman 22
11.—The Nun's Puzzle 23
12.—The Merchant's Puzzle 24
13.—The Man of Law's Puzzle 25
14.—The Weaver's Puzzle 26
15.—The Cook's Puzzle 27
16.—The Sompnour's Puzzle 28
17.—The Monk's Puzzle 30
18.—The Shipman's Puzzle 31
19.—The Puzzle of the Prioress 32
20.—The Puzzle of the Doctor of Physic 33
21.—The Ploughman's Puzzle 34
22.—The Franklin's Puzzle 35
23.—The Squire's Puzzle 36
24.—The Friar's Puzzle 37
25.—The Parson's Puzzle 38
26.—The Haberdasher's Puzzle 40
27.—The Dyer's Puzzle 41
28.—The Great Dispute between the Friar and the Sompnour 42
29.—Chaucer's Puzzle 44
30.—The Puzzle of the Canon's Yeoman 45
31.—The Manciple's Puzzle 46
PUZZLING TIMES AT SOLVAMHALL CASTLE 47
32.—The Game of Bandy-Ball 48
33.—Tilting at the Ring 49
34.—The Noble Demoiselle 50
35.—The Archery Butt 51
36.—The Donjon Keep Window 52
37.—The Crescent and the Cross 53
Конец ознакомительного фрагмента. 54

Henry Ernest Dudeney
The Canterbury Puzzles, and Other Curious Problems

PREFACE

When preparing this new edition for the press, my first inclination was to withdraw a few puzzles that appeared to be of inferior interest, and to substitute others for them. But, on second thoughts, I decided to let the book stand in its original form and add extended solutions and some short notes to certain problems that have in the past involved me in correspondence with interested readers who desired additional information.

I have also provided—what was clearly needed for reference—an index. The very nature and form of the book prevented any separation of the puzzles into classes, but a certain amount of classification will be found in the index. Thus, for example, if the reader has a predilection for problems with Moving Counters, or for Magic Squares, or for Combination and Group Puzzles, he will find that in the index these are brought together for his convenience.

Though the problems are quite different, with the exception of just one or two little variations or extensions, from those in my book *Amusements in Mathematics*, each work being complete in itself, I have thought it would help the reader who happens to have both books before him if I made occasional references that would direct him to solutions and analyses in the later book calculated to elucidate matter in these pages. This course has also obviated the necessity of my repeating myself. For the sake of brevity, *Amusements in Mathematics* is throughout referred to as *A. in M.*

HENRY E. DUDENEY.

The Authors' Club,
July 2, 1919.

INTRODUCTION

Readers of *The Mill on the Floss* will remember that whenever Mr. Tulliver found himself confronted by any little difficulty he was accustomed to make the trite remark, "It's a puzzling world." There can be no denying the fact that we are surrounded on every hand by posers, some of which the intellect of man has mastered, and many of which may be said to be impossible of solution. Solomon himself, who may be supposed to have been as sharp as most men at solving a puzzle, had to admit "there be three things which are too wonderful for me; yea, four which I know not: the way of an eagle in the air; the way of a serpent upon a rock; the way of a ship in the midst of the sea; and the way of a man with a maid."

Probing into the secrets of Nature is a passion with all men; only we select different lines of research. Men have spent long lives in such attempts as to turn the baser metals into gold, to discover perpetual motion, to find a cure for certain malignant diseases, and to navigate the air.

From morning to night we are being perpetually brought face to face with puzzles. But there are puzzles and puzzles. Those that are usually devised for recreation and pastime may be roughly divided into two classes: Puzzles that are built up on some interesting or informing little principle; and puzzles that conceal no principle whatever—such as a picture cut at random into little bits to be put together again, or the juvenile imbecility known as the "rebus," or "picture puzzle." The former species may be said to be adapted to the amusement of the sane man or woman; the latter can be confidently recommended to the feeble-minded.

The curious propensity for propounding puzzles is not peculiar to any race or to any period of history. It is simply innate in every intelligent man, woman, and child that has ever lived, though it is always showing itself in different forms; whether the individual be a Sphinx of Egypt, a Samson of Hebrew lore, an Indian fakir, a Chinese philosopher, a mahatma of Tibet, or a European mathematician makes little difference.

Theologian, scientist, and artisan are perpetually engaged in attempting to solve puzzles, while every game, sport, and pastime is built up of problems of greater or less difficulty. The spontaneous question asked by the child of his parent, by one cyclist of another while taking a brief rest on a stile, by a cricketer during the luncheon hour, or by a yachtsman lazily scanning the horizon, is frequently a problem of considerable difficulty. In short, we are all propounding puzzles to one another every day of our lives—without always knowing it.

A good puzzle should demand the exercise of our best wit and ingenuity, and although a knowledge of mathematics and a certain familiarity with the methods of logic are often of great service in the solution of these things, yet it sometimes happens that a kind of natural cunning and sagacity is of considerable value. For many of the best problems cannot be solved by any familiar scholastic methods, but must be attacked on entirely original lines. This is why, after a long and wide experience, one finds that particular puzzles will sometimes be solved more readily by persons possessing only naturally alert faculties than by the better educated. The best players of such puzzle games as chess and draughts are not mathematicians, though it is just possible that often they may have undeveloped mathematical minds.

It is extraordinary what fascination a good puzzle has for a great many people. We know the thing to be of trivial importance, yet we are impelled to master it; and when we have succeeded there is a pleasure and a sense of satisfaction that are a quite sufficient reward for our trouble, even when there is no prize to be won. What is this mysterious charm that many find irresistible? Why do we like to be puzzled? The curious thing is that directly the enigma is solved the interest generally vanishes. We have done it, and that is enough. But why did we ever attempt to do it?

The answer is simply that it gave us pleasure to seek the solution—that the pleasure was all in the seeking and finding for their own sakes. A good puzzle, like virtue, is its own reward. Man loves

to be confronted by a mystery, and he is not entirely happy until he has solved it. We never like to feel our mental inferiority to those around us. The spirit of rivalry is innate in man; it stimulates the smallest child, in play or education, to keep level with his fellows, and in later life it turns men into great discoverers, inventors, orators, heroes, artists, and (if they have more material aims) perhaps millionaires.

In starting on a tour through the wide realm of Puzzledom we do well to remember that we shall meet with points of interest of a very varied character. I shall take advantage of this variety. People often make the mistake of confining themselves to one little corner of the realm, and thereby miss opportunities of new pleasures that lie within their reach around them. One person will keep to acrostics and other word puzzles, another to mathematical brain-rackers, another to chess problems (which are merely puzzles on the chess-board, and have little practical relation to the game of chess), and so on. This is a mistake, because it restricts one's pleasures, and neglects that variety which is so good for the brain.

And there is really a practical utility in puzzle-solving. Regular exercise is supposed to be as necessary for the brain as for the body, and in both cases it is not so much what we do as the doing of it from which we derive benefit. The daily walk recommended by the doctor for the good of the body, or the daily exercise for the brain, may in itself appear to be so much waste of time; but it is the truest economy in the end. Albert Smith, in one of his amusing novels, describes a woman who was convinced that she suffered from "cobwigs on the brain." This may be a very rare complaint, but in a more metaphorical sense many of us are very apt to suffer from mental cobwebs, and there is nothing equal to the solving of puzzles and problems for sweeping them away. They keep the brain alert, stimulate the imagination, and develop the reasoning faculties. And not only are they useful in this indirect way, but they often directly help us by teaching us some little tricks and "wrinkles" that can be applied in the affairs of life at the most unexpected times and in the most unexpected ways.

There is an interesting passage in praise of puzzles in the quaint letters of Fitzosborne. Here is an extract: "The ingenious study of making and solving puzzles is a science undoubtedly of most necessary acquirement, and deserves to make a part in the meditation of both sexes. It is an art, indeed, that I would recommend to the encouragement of both the Universities, as it affords the easiest and shortest method of conveying some of the most useful principles of logic. It was the maxim of a very wise prince that 'he who knows not how to dissemble knows not how to reign'; and I desire you to receive it as mine, that 'he who knows not how to riddle knows not how to live.'"

How are good puzzles invented? I am not referring to acrostics, anagrams, charades, and that sort of thing, but to puzzles that contain an original idea. Well, you cannot invent a good puzzle to order, any more than you can invent anything else in that manner. Notions for puzzles come at strange times and in strange ways. They are suggested by something we see or hear, and are led up to by other puzzles that come under our notice. It is useless to say, "I will sit down and invent an original puzzle," because there is no way of creating an idea; you can only make use of it when it comes. You may think this is wrong, because an expert in these things will make scores of puzzles while another person, equally clever, cannot invent one "to save his life," as we say. The explanation is very simple. The expert knows an idea when he sees one, and is able by long experience to judge of its value. Fertility, like facility, comes by practice.

Sometimes a new and most interesting idea is suggested by the blunder of somebody over another puzzle. A boy was given a puzzle to solve by a friend, but he misunderstood what he had to do, and set about attempting what most likely everybody would have told him was impossible. But he was a boy with a will, and he stuck at it for six months, off and on, until he actually succeeded. When his friend saw the solution, he said, "This is not the puzzle I intended—you misunderstood me—but you have found out something much greater!" And the puzzle which that boy accidentally discovered is now in all the old puzzle books.

Puzzles can be made out of almost anything, in the hands of the ingenious person with an idea. Coins, matches, cards, counters, bits of wire or string, all come in useful. An immense number of puzzles have been made out of the letters of the alphabet, and from those nine little digits and cipher, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0.

It should always be remembered that a very simple person may propound a problem that can only be solved by clever heads—if at all. A child asked, "Can God do everything?" On receiving an affirmative reply, she at once said: "Then can He make a stone so heavy that He can't lift it?" Many wide-awake grown-up people do not at once see a satisfactory answer. Yet the difficulty lies merely in the absurd, though cunning, form of the question, which really amounts to asking, "Can the Almighty destroy His own omnipotence?" It is somewhat similar to the other question, "What would happen if an irresistible moving body came in contact with an immovable body?" Here we have simply a contradiction in terms, for if there existed such a thing as an immovable body, there could not at the same time exist a moving body that nothing could resist.

Professor Tyndall used to invite children to ask him puzzling questions, and some of them were very hard nuts to crack. One child asked him why that part of a towel that was dipped in water was of a darker colour than the dry part. How many readers could give the correct reply? Many people are satisfied with the most ridiculous answers to puzzling questions. If you ask, "Why can we see through glass?" nine people out of ten will reply, "Because it is transparent;" which is, of course, simply another way of saying, "Because we can see through it."

Puzzles have such an infinite variety that it is sometimes very difficult to divide them into distinct classes. They often so merge in character that the best we can do is to sort them into a few broad types. Let us take three or four examples in illustration of what I mean.

First there is the ancient Riddle, that draws upon the imagination and play of fancy. Readers will remember the riddle of the Sphinx, the monster of Bœotia who propounded enigmas to the inhabitants and devoured them if they failed to solve them. It was said that the Sphinx would destroy herself if one of her riddles was ever correctly answered. It was this: "What animal walks on four legs in the morning, two at noon, and three in the evening?" It was explained by Œdipus, who pointed out that man walked on his hands and feet in the morning of life, at the noon of life he walked erect, and in the evening of his days he supported his infirmities with a stick. When the Sphinx heard this explanation, she dashed her head against a rock and immediately expired. This shows that puzzle solvers may be really useful on occasion.

Then there is the riddle propounded by Samson. It is perhaps the first prize competition in this line on record, the prize being thirty sheets and thirty changes of garments for a correct solution. The riddle was this: "Out of the eater came forth meat, and out of the strong came forth sweetness." The answer was, "A honey-comb in the body of a dead lion." To-day this sort of riddle survives in such a form as, "Why does a chicken cross the road?" to which most people give the answer, "To get to the other side;" though the correct reply is, "To worry the chauffeur." It has degenerated into the conundrum, which is usually based on a mere pun. For example, we have been asked from our infancy, "When is a door not a door?" and here again the answer usually furnished ("When it is a-jar") is not the correct one. It should be, "When it is a negress (an egress)."

There is the large class of Letter Puzzles, which are based on the little peculiarities of the language in which they are written—such as anagrams, acrostics, word-squares, and charades. In this class we also find palindromes, or words and sentences that read backwards and forwards alike. These must be very ancient indeed, if it be true that Adam introduced himself to Eve (in the English language, be it noted) with the palindromic words, "Madam, I'm Adam," to which his consort replied with the modest palindrome "Eve."

Then we have Arithmetical Puzzles, an immense class, full of diversity. These range from the puzzle that the algebraist finds to be nothing but a "simple equation," quite easy of direct solution, up to the profoundest problems in the elegant domain of the theory of numbers.

Next we have the Geometrical Puzzle, a favourite and very ancient branch of which is the puzzle in dissection, requiring some plane figure to be cut into a certain number of pieces that will fit together and form another figure. Most of the wire puzzles sold in the streets and toy-shops are concerned with the geometry of position.

But these classes do not nearly embrace all kinds of puzzles even when we allow for those that belong at once to several of the classes. There are many ingenious mechanical puzzles that you cannot classify, as they stand quite alone: there are puzzles in logic, in chess, in draughts, in cards, and in dominoes, while every conjuring trick is nothing but a puzzle, the solution to which the performer tries to keep to himself.

There are puzzles that look easy and are easy, puzzles that look easy and are difficult, puzzles that look difficult and are difficult, and puzzles that look difficult and are easy, and in each class we may of course have degrees of easiness and difficulty. But it does not follow that a puzzle that has conditions that are easily understood by the merest child is in itself easy. Such a puzzle might, however, look simple to the uninformed, and only prove to be a very hard nut to him after he had actually tackled it.

For example, if we write down nineteen ones to form the number 1,111,111,111,111,111,111, and then ask for a number (other than 1 or itself) that will divide it without remainder, the conditions are perfectly simple, but the task is terribly difficult. Nobody in the world knows yet whether that number has a divisor or not. If you can find one, you will have succeeded in doing something that nobody else has ever done.[1]

The number composed of seventeen ones, 11,111,111,111,111,111, has only these two divisors, 2,071,723 and 5,363,222,357, and their discovery is an exceedingly heavy task. The only number composed only of ones that we know with certainty to have no divisor is 11. Such a number is, of course, called a prime number.

The maxim that there are always a right way and a wrong way of doing anything applies in a very marked degree to the solving of puzzles. Here the wrong way consists in making aimless trials without method, hoping to hit on the answer by accident—a process that generally results in our getting hopelessly entangled in the trap that has been artfully laid for us.

Occasionally, however, a problem is of such a character that, though it may be solved immediately by trial, it is very difficult to do by a process of pure reason. But in most cases the latter method is the only one that gives any real pleasure.

When we sit down to solve a puzzle, the first thing to do is to make sure, as far as we can, that we understand the conditions. For if we do not understand what it is we have to do, we are not very likely to succeed in doing it. We all know the story of the man who was asked the question, "If a herring and a half cost three-halfpence, how much will a dozen herrings cost?" After several unsuccessful attempts he gave it up, when the propounder explained to him that a dozen herrings would cost a shilling. "Herrings!" exclaimed the other apologetically; "I was working it out in haddocks!"

It sometimes requires more care than the reader might suppose so to word the conditions of a new puzzle that they are at once clear and exact and not so prolix as to destroy all interest in the thing. I remember once propounding a problem that required something to be done in the "fewest possible straight lines," and a person who was either very clever or very foolish (I have never quite determined which) claimed to have solved it in only one straight line, because, as she said, "I have taken care to make all the others crooked!" Who could have anticipated such a quibble?

Then if you give a "crossing the river" puzzle, in which people have to be got over in a boat that will only hold a certain number or combination of persons, directly the would-be solver fails to master the difficulty he boldly introduces a rope to pull the boat across. You say that a rope is forbidden; and he then falls back on the use of a current in the stream. I once thought I had carefully excluded all

[1] See footnote on page 198.

such tricks in a particular puzzle of this class. But a sapient reader made all the people swim across without using the boat at all! Of course, some few puzzles are intended to be solved by some trick of this kind; and if there happens to be no solution without the trick it is perfectly legitimate. We have to use our best judgment as to whether a puzzle contains a catch or not; but we should never hastily assume it. To quibble over the conditions is the last resort of the defeated would-be solver.

Sometimes people will attempt to bewilder you by curious little twists in the meaning of words. A man recently propounded to me the old familiar problem, "A boy walks round a pole on which is a monkey, but as the boy walks the monkey turns on the pole so as to be always facing him on the opposite side. Does the boy go around the monkey?" I replied that if he would first give me his definition of "to go around" I would supply him with the answer. Of course, he demurred, so that he might catch me either way. I therefore said that, taking the words in their ordinary and correct meaning, most certainly the boy went around the monkey. As was expected, he retorted that it was not so, because he understood by "going around" a thing that you went in such a way as to see all sides of it. To this I made the obvious reply that consequently a blind man could not go around anything.

He then amended his definition by saying that the actual seeing all sides was not essential, but you went in such a way that, given sight, you could see all sides. Upon which it was suggested that consequently you could not walk around a man who had been shut up in a box! And so on. The whole thing is amusingly stupid, and if at the start you, very properly, decline to admit any but a simple and correct definition of "to go around," there is no puzzle left, and you prevent an idle, and often heated, argument.

When you have grasped your conditions, always see if you cannot simplify them, for a lot of confusion is got rid of in this way. Many people are puzzled over the old question of the man who, while pointing at a portrait, says, "Brothers and sisters have I none, but that man's father is my father's son." What relation did the man in the picture bear to the speaker? Here you simplify by saying that "my father's son" must be either "myself" or "my brother." But, since the speaker has no brother, it is clearly "myself." The statement simplified is thus nothing more than, "That man's father is myself," and it was obviously his son's portrait. Yet people fight over this question by the hour!

There are mysteries that have never been solved in many branches of Puzzledom. Let us consider a few in the world of numbers—little things the conditions of which a child can understand, though the greatest minds cannot master. Everybody has heard the remark, "It is as hard as squaring a circle," though many people have a very hazy notion of what it means. If you have a circle of given diameter and wish to find the side of a square that shall contain exactly the same area, you are confronted with the problem of squaring the circle. Well, it cannot be done with exactitude (though we can get an answer near enough for all practical purposes), because it is not possible to say in exact numbers what is the ratio of the diameter to the circumference. But it is only in recent times that it has been proved to be impossible, for it is one thing not to be able to perform a certain feat, but quite another to prove that it cannot be done. Only uninstructed cranks now waste their time in trying to square the circle.

Again, we can never measure exactly in numbers the diagonal of a square. If you have a window pane exactly a foot on every side, there is the distance from corner to corner staring you in the face, yet you can never say in exact numbers what is the length of that diagonal. The simple person will at once suggest that we might take our diagonal first, say an exact foot, and then construct our square. Yes, you can do this, but then you can never say exactly what is the length of the side. You can have it which way you like, but you cannot have it both ways.

All my readers know what a magic square is. The numbers 1 to 9 can be arranged in a square of nine cells, so that all the columns and rows and each of the diagonals will add up 15. It is quite easy; and there is only one way of doing it, for we do not count as different the arrangements obtained by merely turning round the square and reflecting it in a mirror. Now if we wish to make a magic square of the 16 numbers, 1 to 16, there are just 880 different ways of doing it, again not counting reversals

and reflections. This has been finally proved of recent years. But how many magic squares may be formed with the 25 numbers, 1 to 25, nobody knows, and we shall have to extend our knowledge in certain directions before we can hope to solve the puzzle. But it is surprising to find that exactly 174,240 such squares may be formed of one particular restricted kind only—the bordered square, in which the inner square of nine cells is itself magic. And I have shown how this number may be at once doubled by merely converting every bordered square—by a simple rule—into a non-bordered one.

Then vain attempts have been made to construct a magic square by what is called a "knight's tour" over the chess-board, numbering each square that the knight visits in succession, 1, 2, 3, 4, etc.; and it has been done, with the exception of the two diagonals, which so far have baffled all efforts. But it is not certain that it cannot be done.

Though the contents of the present volume are in the main entirely original, some very few old friends will be found; but these will not, I trust, prove unwelcome in the new dress that they have received. The puzzles are of every degree of difficulty, and so varied in character that perhaps it is not too much to hope that every true puzzle lover will find ample material to interest—and possibly instruct. In some cases I have dealt with the methods of solution at considerable length, but at other times I have reluctantly felt obliged to restrict myself to giving the bare answers. Had the full solutions and proofs been given in the case of every puzzle, either half the problems would have had to be omitted, or the size of the book greatly increased. And the plan that I have adopted has its advantages, for it leaves scope for the mathematical enthusiast to work out his own analysis. Even in those cases where I have given a general formula for the solution of a puzzle, he will find great interest in verifying it for himself.

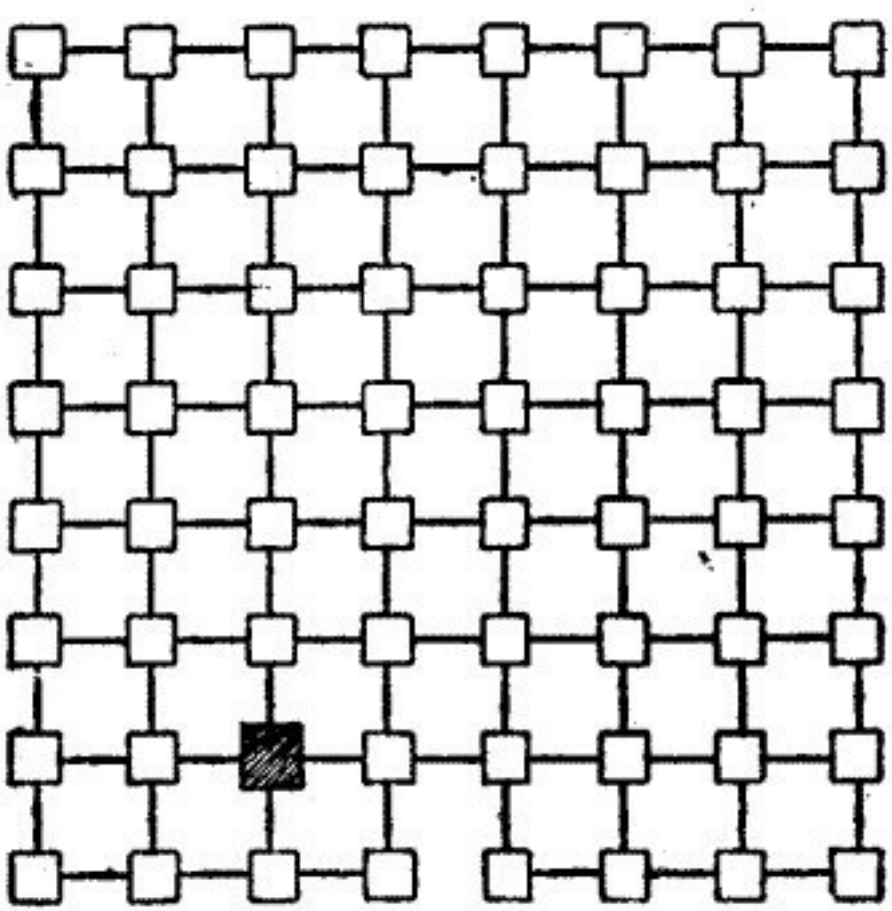
THE CANTERBURY PUZZLES

A Chance-gathered company of pilgrims, on their way to the shrine of Saint Thomas à Becket at Canterbury, met at the old Tabard Inn, later called the Talbot, in Southwark, and the host proposed that they should beguile the ride by each telling a tale to his fellow-pilgrims. This we all know was the origin of the immortal *Canterbury Tales* of our great fourteenth-century poet, Geoffrey Chaucer. Unfortunately, the tales were never completed, and perhaps that is why the quaint and curious "Canterbury Puzzles," devised and propounded by the same body of pilgrims, were not also recorded by the poet's pen. This is greatly to be regretted, since Chaucer, who, as Leland tells us, was an "ingenious mathematician" and the author of a learned treatise on the astrolabe, was peculiarly fitted for the propounding of problems. In presenting for the first time some of these old-world posers, I will not stop to explain the singular manner in which they came into my possession, but proceed at once, without unnecessary preamble, to give my readers an opportunity of solving them and testing their quality. There are certainly far more difficult puzzles extant, but difficulty and interest are two qualities of puzzledom that do not necessarily go together.

1.—*The Reve's Puzzle*

The Reve was a wily man and something of a scholar. As Chaucer tells us, "There was no auditor could of him win," and "there could no man bring him in arrear." The poet also noticed that "ever he rode the hindermost of the route." This he did that he might the better, without interruption, work out the fanciful problems and ideas that passed through his active brain. When the pilgrims were stopping at a wayside tavern, a number of cheeses of varying sizes caught his alert eye; and calling for four stools, he told the company that he would show them a puzzle of his own that would keep them amused during their rest. He then placed eight cheeses of graduating sizes on one of the end stools, the smallest cheese being at the top, as clearly shown in the illustration. "This is a riddle," quoth he, "that I did once set before my fellow townsmen at Baldeswell, that is in Norfolk, and, by Saint Joce, there was no man among them that could rede it aright. And yet it is withal full easy, for all that I do desire is that, by the moving of one cheese at a time from one stool unto another, ye shall remove all the cheeses to the stool at the other end without ever putting any cheese on one that is smaller than itself. To him that will perform this feat in the least number of moves that be possible will I give a draught of the best that our good host can provide." To solve this puzzle in the fewest possible moves, first with 8, then with 10, and afterwards with 21 cheeses, is an interesting recreation.

2.—*The Pardoner's Puzzle*



The gentle Pardoner, "that straight was come from the court of Rome," begged to be excused; but the company would not spare him. "Friends and fellow-pilgrims," said he, "of a truth the riddle that I have made is but a poor thing, but it is the best that I have been able to devise. Blame my lack of knowledge of such matters if it be not to your liking." But his invention was very well received. He produced the accompanying plan, and said that it represented sixty-four towns through which he had to pass during some of his pilgrimages, and the lines connecting them were roads. He explained that the puzzle was to start from the large black town and visit all the other towns once, and once only, in fifteen straight pilgrimages. Try to trace the route in fifteen straight lines with your pencil. You may end where you like, but note that the omission of a little road at the bottom is intentional, as it seems that it was impossible to go that way.

3.—*The Miller's Puzzle*

The Miller next took the company aside and showed them nine sacks of flour that were standing as depicted in the sketch. "Now, hearken, all and some," said he, "while that I do set ye the riddle of the nine sacks of flour. And mark ye, my lords and masters, that there be single sacks on the outside, pairs next unto them, and three together in the middle thereof. By Saint Benedict, it doth so happen that if we do but multiply the pair, 28, by the single one, 7, the answer is 196, which is of a truth the number shown by the sacks in the middle. Yet it be not true that the other pair, 34, when so multiplied by its neighbour, 5, will also make 196. Wherefore I do beg you, gentle sirs, so to place anew the nine sacks with as little trouble as possible that each pair when thus multiplied by its single neighbour shall make the number in the middle." As the Miller has stipulated in effect that as few bags as possible shall be moved, there is only one answer to this puzzle, which everybody should be able to solve.

4.—*The Knight's Puzzle*

This worthy man was, as Chaucer tells us, "a very perfect, gentle knight," and "In many a noble army had he been: At mortal battles had he been fifteen." His shield, as he is seen showing it to the company at the "Tabard" in the illustration, was, in the peculiar language of the heralds, "argent, semée of roses, gules," which means that on a white ground red roses were scattered or strewn, as seed is sown by the hand. When this knight was called on to propound a puzzle, he said to the company, "This riddle a wight did ask of me when that I fought with the lord of Palatine against the heathen in Turkey. In thy hand take a piece of chalk and learn how many perfect squares thou canst make with one of the eighty-seven roses at each corner thereof." The reader may find it an interesting problem to count the number of squares that may be formed on the shield by uniting four roses.

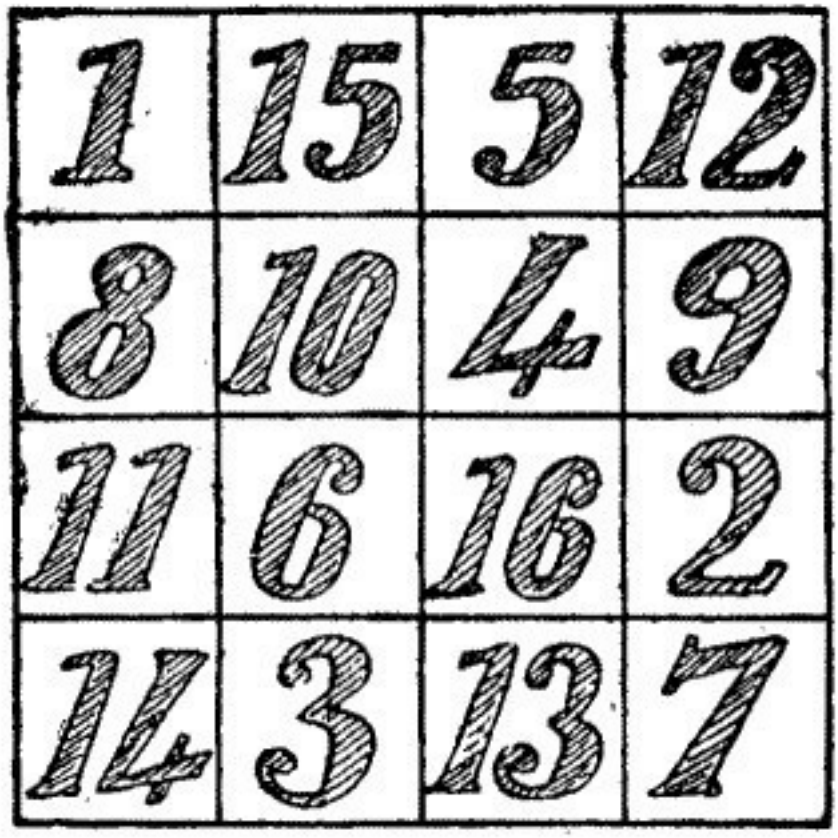
5.—*The Wife of Bath's Riddles*

The frolicsome Wife of Bath, when called upon to favour the company, protested that she had no aptitude for such things, but that her fourth husband had had a liking for them, and she remembered one of his riddles that might be new to her fellow pilgrims: "Why is a bung that hath been made fast in a barrel like unto another bung that is just falling out of a barrel?" As the company promptly answered this easy conundrum, the lady went on to say that when she was one day seated sewing in her private chamber her son entered. "Upon receiving," saith she, "the parental command, 'Depart, my son, and do not disturb me!' he did reply, 'I am, of a truth, thy son; but thou art not my mother, and until thou hast shown me how this may be I shall not go forth.'" This perplexed the company a good deal, but it is not likely to give the reader much difficulty.

6.—*The Host's Puzzle*

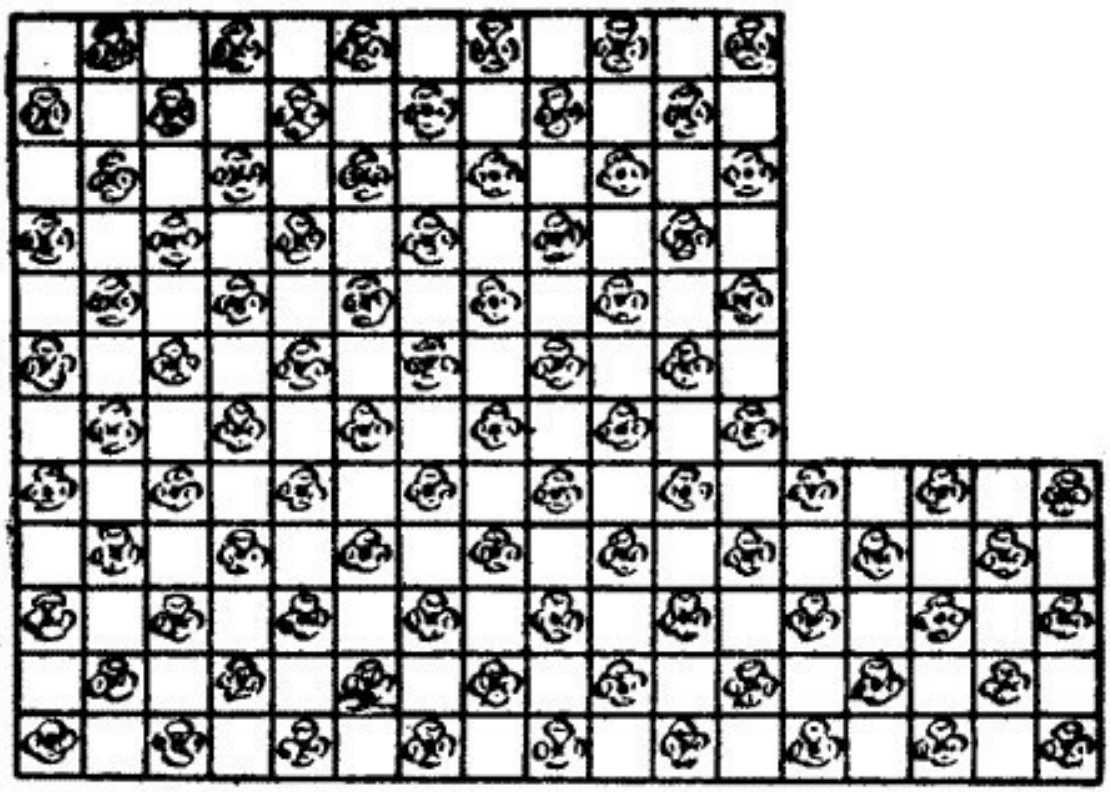
Perhaps no puzzle of the whole collection caused more jollity or was found more entertaining than that produced by the Host of the "Tabard," who accompanied the party all the way. He called the pilgrims together and spoke as follows: "My merry masters all, now that it be my turn to give your brains a twist, I will show ye a little piece of craft that will try your wits to their full bent. And yet methinks it is but a simple matter when the doing of it is made clear. Here be a cask of fine London ale, and in my hands do I hold two measures—one of five pints, and the other of three pints. Pray show how it is possible for me to put a true pint into each of the measures." Of course, no other vessel or article is to be used, and no marking of the measures is allowed. It is a knotty little problem and a fascinating one. A good many persons to-day will find it by no means an easy task. Yet it can be done.

7.—*The Clerk of Oxenford's Puzzle*



The silent and thoughtful Clerk of Oxenford, of whom it is recorded that "Every farthing that his friends e'er lent, In books and learning was it always spent," was prevailed upon to give his companions a puzzle. He said, "Ofttimes of late have I given much thought to the study of those strange talismans to ward off the plague and such evils that are yclept magic squares, and the secret of such things is very deep and the number of such squares truly great. But the small riddle that I did make yester eve for the purpose of this company is not so hard that any may not find it out with a little patience." He then produced the square shown in the illustration and said that it was desired so to cut it into four pieces (by cuts along the lines) that they would fit together again and form a perfect magic square, in which the four columns, the four rows, and the two long diagonals should add up 34. It will be found that this is a just sufficiently easy puzzle for most people's tastes.

8.—*The Tapiser's Puzzle*



Then came forward the Tapiser, who was, of course, a maker of tapestry, and must not be confounded with a tapster, who draws and sells ale.

He produced a beautiful piece of tapestry, worked in a simple chequered pattern, as shown in the diagram. "This piece of tapestry, sirs," quoth he, "hath one hundred and sixty-nine small squares, and I do desire you to tell me the manner of cutting the tapestry into three pieces that shall fit together and make one whole piece in shape of a perfect square.

"Moreover, since there be divers ways of so doing, I do wish to know that way wherein two of the pieces shall together contain as much as possible of the rich fabric." It is clear that the Tapiser intended the cuts to be made along the lines dividing the squares only, and, as the material was not both sides alike, no piece may be reversed, but care must be observed that the chequered pattern matches properly.

9.—*The Carpenter's Puzzle*

The Carpenter produced the carved wooden pillar that he is seen holding in the illustration, wherein the knight is propounding his knotty problem to the goodly company (No. 4), and spoke as follows: "There dwelleth in the city of London a certain scholar that is learned in astrology and other strange arts. Some few days gone he did bring unto me a piece of wood that had three feet in length, one foot in breadth and one foot in depth, and did desire that it be carved and made into the pillar that you do now behold. Also did he promise certain payment for every cubic inch of wood cut away by the carving thereof.

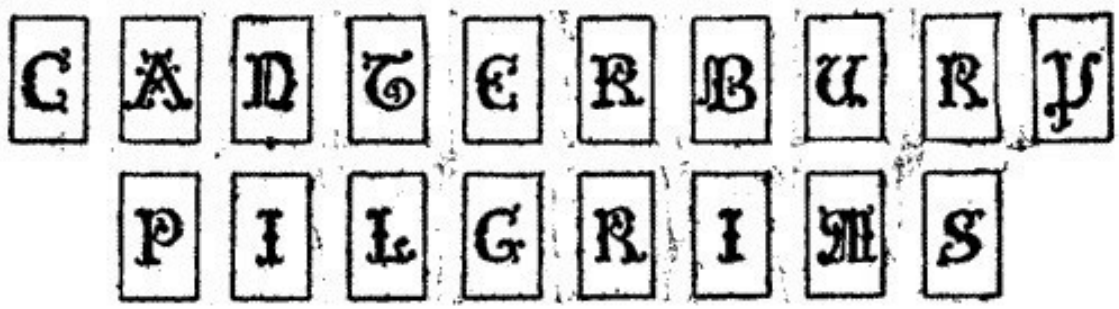
"Now I did at first weigh the block, and found it truly to contain thirty pounds, whereas the pillar doth now weigh but twenty pounds. Of a truth I have therefore cut away one cubic foot (which is to say one-third) of the three cubic feet of the block; but this scholar withal doth hold that payment may not thus be fairly made by weight, since the heart of the block may be heavier, or perchance may be more light, than the outside. How then may I with ease satisfy the scholar as to the quantity of wood that hath been cut away?" This at first sight looks a difficult question, but it is so absurdly simple that the method employed by the carpenter should be known to everybody to-day, for it is a very useful little "wrinkle."

10.—*The Puzzle of the Squire's Yeoman*

Chaucer says of the Squire's Yeoman, who formed one of his party of pilgrims, "A forester was he truly as I guess," and tells us that "His arrows drooped not with feathers low, And in his hand he bare a mighty bow." When a halt was made one day at a wayside inn, bearing the old sign of the "Chequers," this yeoman consented to give the company an exhibition of his skill. Selecting nine good arrows, he said, "Mark ye, good sirs, how that I shall shoot these nine arrows in such manner that each of them shall lodge in the middle of one of the squares that be upon the sign of the 'Chequers,' and yet of a truth shall no arrow be in line with any other arrow." The diagram will show exactly how he did this, and no two arrows will be found in line, horizontally, vertically, or diagonally. Then the Yeoman said: "Here then is a riddle for ye. Remove three of the arrows each to one of its neighbouring squares, so that the nine shall yet be so placed that none thereof may be in line with another." By a "neighbouring square" is meant one that adjoins, either laterally or diagonally.

11.—*The Nun's Puzzle*

"I trow there be not one among ye," quoth the Nun, on a later occasion, "that doth not know that many monks do oft pass the time in play at certain games, albeit they be not lawful for them. These games, such as cards and the game of chess, do they cunningly hide from the abbot's eye by putting them away in holes that they have cut out of the very hearts of great books that be upon their shelves. Shall the nun therefore be greatly blamed if she do likewise? I will show a little riddle game that we do sometimes play among ourselves when the good abbess doth hap to be away."



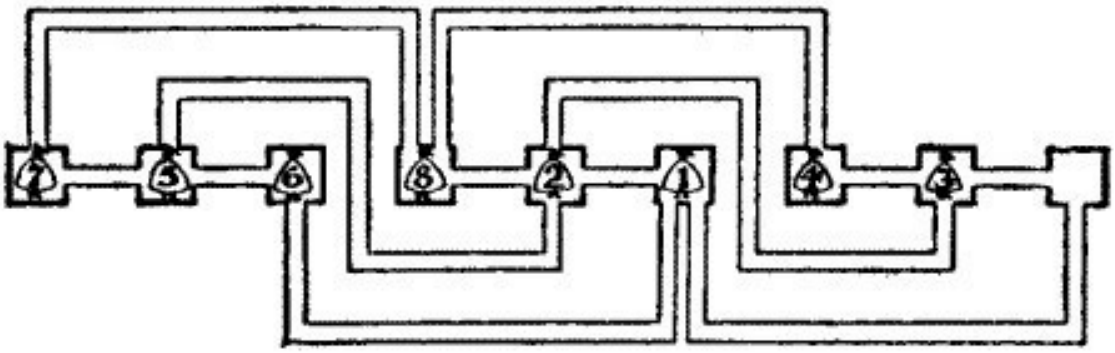
The Nun then produced the eighteen cards that are shown in the illustration. She explained that the puzzle was so to arrange the cards in a pack, that by placing the uppermost one on the table, placing the next one at the bottom of the pack, the next one on the table, the next at the bottom of the pack, and so on, until all are on the table, the eighteen cards shall then read "CANTERBURY PILGRIMS." Of course each card must be placed on the table to the immediate right of the one that preceded it. It is easy enough if you work backwards, but the reader should try to arrive at the required order without doing this, or using any actual cards.

12.—*The Merchant's Puzzle*

Of the Merchant the poet writes, "Forsooth he was a worthy man withal." He was thoughtful, full of schemes, and a good manipulator of figures. "His reasons spake he eke full solemnly. Sounding away the increase of his winning." One morning, when they were on the road, the Knight and the Squire, who were riding beside him, reminded the Merchant that he had not yet propounded the puzzle that he owed the company. He thereupon said, "Be it so? Here then is a riddle in numbers that I will set before this merry company when next we do make a halt. There be thirty of us in all riding over the common this morn. Truly we may ride one and one, in what they do call the single file, or two and two, or three and three, or five and five, or six and six, or ten and ten, or fifteen and fifteen, or all thirty in a row. In no other way may we ride so that there be no lack of equal numbers in the rows. Now, a party of pilgrims were able thus to ride in as many as sixty-four different ways. Prithee tell me how many there must perforce have been in the company." The Merchant clearly required the smallest number of persons that could so ride in the sixty-four ways.

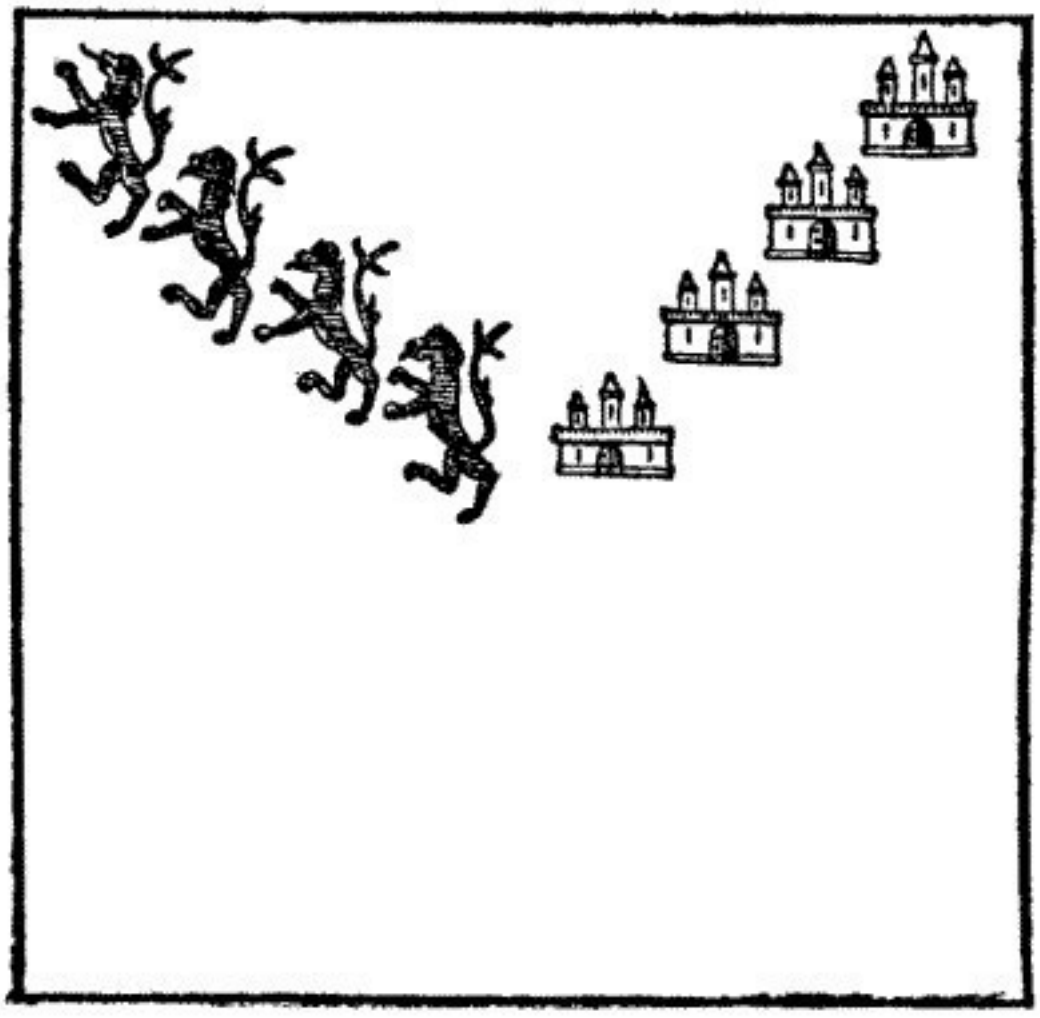
13.—*The Man of Law's Puzzle*

The Sergeant of the Law was "full rich of excellence. Discreet he was, and of great reverence." He was a very busy man, but, like many of us to-day, "he seemed busier than he was." He was talking one evening of prisons and prisoners, and at length made the following remarks: "And that which I have been saying doth forsooth call to my mind that this morn I bethought me of a riddle that I will now put forth." He then produced a slip of vellum, on which was drawn the curious plan that is now given. "Here," saith he, "be nine dungeons, with a prisoner in every dungeon save one, which is empty. These prisoners be numbered in order, 7, 5, 6, 8, 2, 1, 4, 3, and I desire to know how they can, in as few moves as possible, put themselves in the order 1, 2, 3, 4, 5, 6, 7, 8. One prisoner may move at a time along the passage to the dungeon that doth happen to be empty, but never, on pain of death, may two men be in any dungeon at the same time. How may it be done?" If the reader makes a rough plan on a sheet of paper and uses numbered counters, he will find it an interesting pastime to arrange the prisoners in the fewest possible moves. As there is never more than one vacant dungeon at a time to be moved into, the moves may be recorded in this simple way: 3—2—1—6, and so on.



14.—*The Weaver's Puzzle*

When the Weaver brought out a square piece of beautiful cloth, daintily embroidered with lions and castles, as depicted in the illustration, the pilgrims disputed among themselves as to the meaning of these ornaments. The Knight, however, who was skilled in heraldry, explained that they were probably derived from the lions and castles borne in the arms of Ferdinand III., the King of Castile and Leon, whose daughter was the first wife of our Edward I. In this he was undoubtedly correct. The puzzle that the Weaver proposed was this. "Let us, for the nonce, see," saith he, "if there be any of the company that can show how this piece of cloth may be cut into four several pieces, each of the same size and shape, and each piece bearing a lion and a castle." It is not recorded that anybody mastered this puzzle, though it is quite possible of solution in a satisfactory manner. No cut may pass through any part of a lion or a castle.



15.—*The Cook's Puzzle*

We find that there was a cook among the company; and his services were no doubt at times in great request, "For he could roast and seethe, and broil and fry, And make a mortress and well bake a pie." One night when the pilgrims were seated at a country hostelry, about to begin their repast, the cook presented himself at the head of the table that was presided over by the Franklin, and said, "Listen awhile, my masters, while that I do ask ye a riddle, and by Saint Moden it is one that I cannot answer myself withal. There be eleven pilgrims seated at this board on which is set a warden pie and a venison pasty, each of which may truly be divided into four parts and no more. Now, mark ye, five out of the eleven pilgrims can eat the pie, but will not touch the pasty, while four will eat the pasty but turn away from the pie. Moreover, the two that do remain be able and willing to eat of either. By my halidame, is there any that can tell me in how many different ways the good Franklin may choose whom he will serve?" I will just caution the reader that if he is not careful he will find, when he sees the answer, that he has made a mistake of forty, as all the company did, with the exception of the Clerk of Oxenford, who got it right by accident, through putting down a wrong figure.

Strange to say, while the company perplexed their wits about this riddle the cook played upon them a merry jest. In the midst of their deep thinking and hot dispute what should the cunning knave do but stealthily take away both the pie and the pasty. Then, when hunger made them desire to go on with the repast, finding there was nought upon the table, they called clamorously for the cook.

"My masters," he explained, "seeing you were so deep set in the riddle, I did take them to the next room, where others did eat them with relish ere they had grown cold. There be excellent bread and cheese in the pantry."

16.—*The Sompnour's Puzzle*

The Sompnour, or Summoner, who, according to Chaucer, joined the party of pilgrims, was an officer whose duty was to summon delinquents to appear in ecclesiastical courts. In later times he became known as the apparitor. Our particular individual was a somewhat quaint though worthy man. "He was a gentle hireling and a kind; A better fellow should a man not find." In order that the reader may understand his appearance in the picture, it must be explained that his peculiar headgear is duly recorded by the poet. "A garland had he set upon his head, As great as if it were for an ale-stake."

One evening ten of the company stopped at a village inn and requested to be put up for the night, but mine host could only accommodate five of them. The Sompnour suggested that they should draw lots, and as he had had experience in such matters in the summoning of juries and in other ways, he arranged the company in a circle and proposed a "count out." Being of a chivalrous nature, his little plot was so to arrange that the men should all fall out and leave the ladies in possession. He therefore gave the Wife of Bath a number and directed her to count round and round the circle, in a clockwise direction, and the person on whom that number fell was immediately to step out of the ring. The count then began afresh at the next person. But the lady misunderstood her instructions, and selected in mistake the number eleven and started the count at herself. As will be found, this

resulted in all the women falling out in turn instead of the men, for every eleventh person withdrawn from the circle is a lady.

"Of a truth it was no fault of mine," said the Sompnour next day to the company, "and herein is methinks a riddle. Can any tell me what number the good Wife should have used withal, and at which pilgrim she should have begun her count so that no other than the five men should have been counted out?" Of course, the point is to find the smallest number that will have the desired effect.

17.—*The Monk's Puzzle*

The Monk that went with the party was a great lover of sport. "Greyhounds he had as swift as fowl of flight: Of riding and of hunting for the hare Was all his love, for no cost would he spare." One day he addressed the pilgrims as follows:—

"There is a little matter that hath at times perplexed me greatly, though certes it is of no great weight; yet may it serve to try the wits of some that be cunning in such things. Nine kennels have I for the use of my dogs, and they be put in the form of a square; though the one in the middle I do never use, it not being of a useful nature. Now the riddle is to find in how many different ways I may place my dogs in all or any of the outside kennels so that the number of dogs on every side of the square may be just ten." The small diagrams show four ways of doing it, and though the fourth way is merely a reversal of the third, it counts as different. Any kennels may be left empty. This puzzle was evidently a variation of the ancient one of the Abbess and her Nuns.

18.—*The Shipman's Puzzle*

Of this person we are told, "He knew well all the havens, as they were, From Gothland to the Cape of Finisterre, And every creek in Brittany and Spain: His barque yclepéd was the *Magdalen*." The strange puzzle in navigation that he propounded was as follows.

"Here be a chart," quoth the Shipman, "of five islands, with the inhabitants of which I do trade. In each year my good ship doth sail over every one of the ten courses depicted thereon, but never may she pass along the same course twice in any year. Is there any among the company who can tell me in how many different ways I may direct the *Magdalen's* ten yearly voyages, always setting out from the same island?"

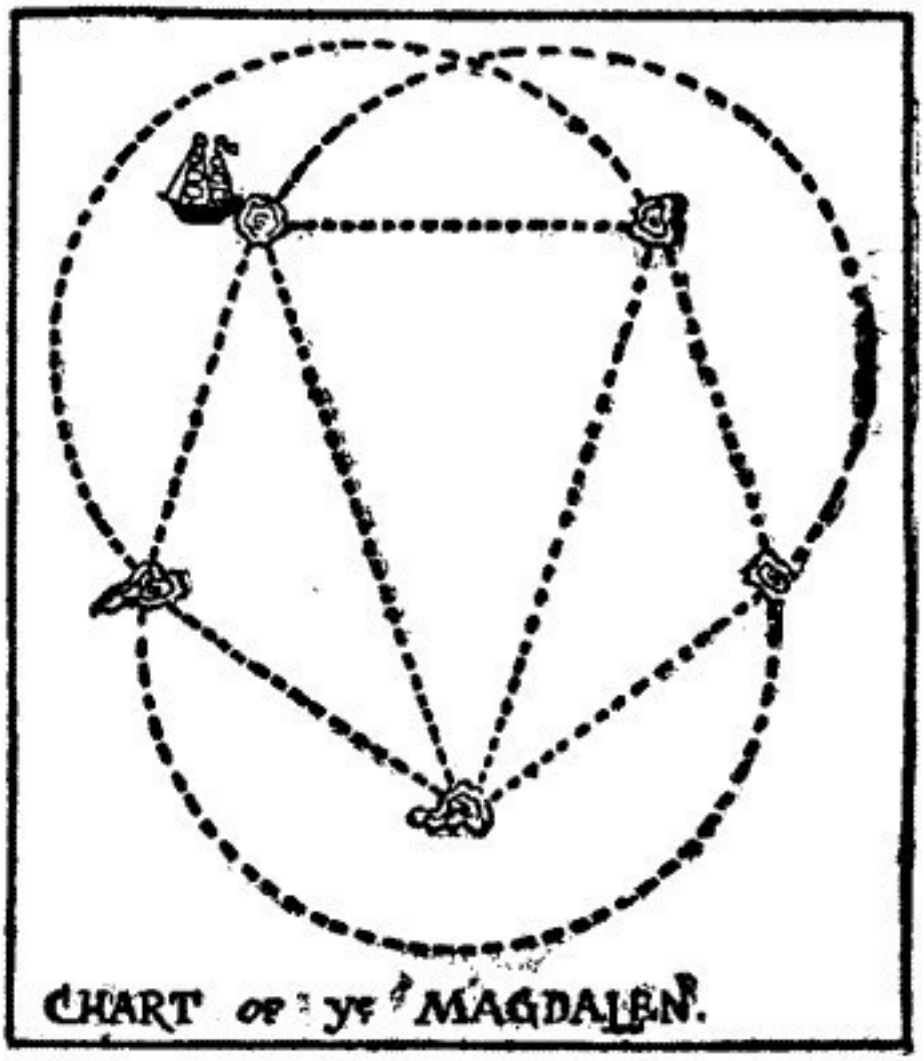
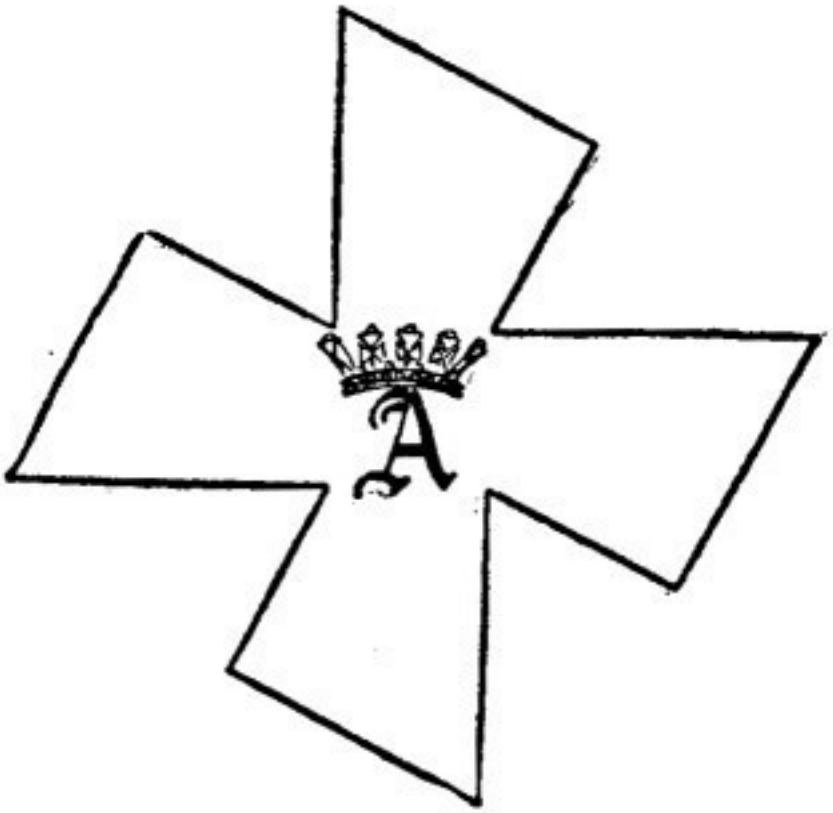


CHART of ye MAGDALEN

19.—*The Puzzle of the Prioress*

The Prioress, who went by the name of Eglantine, is best remembered on account of Chaucer's remark, "And French she spake full fair and properly, After the school of Stratford-atté-Bow, For French of Paris was to her unknow." But our puzzle has to do less with her character and education than with her dress. "And thereon hung a brooch of gold full sheen, On which was written first a crownéd A." It is with the brooch that we are concerned, for when asked to give a puzzle she showed this jewel to the company and said: "A learned man from Normandy did once give me this brooch as a charm, saying strange and mystic things anent it, how that it hath an affinity for the square, and such other wise words that were too subtle for me. But the good Abbot of Chertsey did once tell me that the cross may be so cunningly cut into four pieces that they will join and make a perfect square; though on my faith I know not the manner of doing it."

It is recorded that "the pilgrims did find no answer to the riddle, and the Clerk of Oxenford thought that the Prioress had been deceived in the matter thereof; whereupon the lady was sore vexed, though the gentle knight did flout and gibe at the poor clerk because of his lack of understanding over other of the riddles, which did fill him with shame and make merry the company."

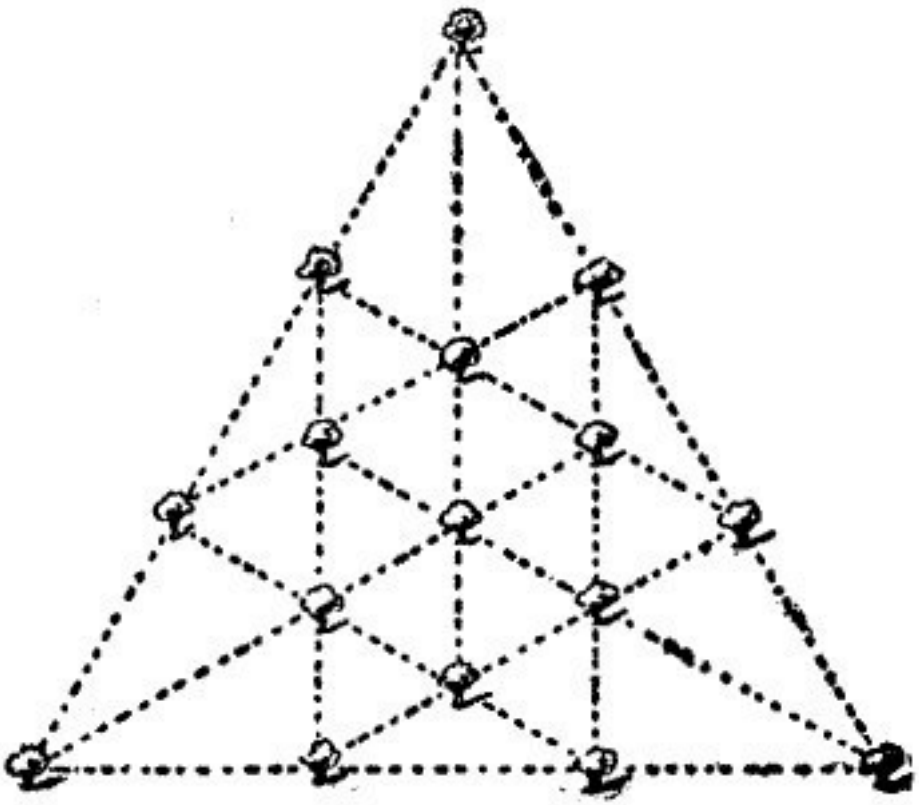


20.—*The Puzzle of the Doctor of Physic*

This Doctor, learned though he was, for "In all this world to him there was none like To speak of physic and of surgery," and "He knew the cause of every malady," yet was he not indifferent to the more material side of life. "Gold in physic is a cordial; Therefore he lovéd gold in special." The problem that the Doctor propounded to the assembled pilgrims was this. He produced two spherical phials, as shown in our illustration, and pointed out that one phial was exactly a foot in circumference, and the other two feet in circumference.

"I do wish," said the Doctor, addressing the company, "to have the exact measures of two other phials, of a like shape but different in size, that may together contain just as much liquid as is contained by these two." To find exact dimensions in the smallest possible numbers is one of the toughest nuts I have attempted. Of course the thickness of the glass, and the neck and base, are to be ignored.

21.—*The Ploughman's Puzzle*



The Ploughman—of whom Chaucer remarked, "A worker true and very good was he, Living in perfect peace and charity"—protested that riddles were not for simple minds like his, but he would show the good pilgrims, if they willed it, one that he had frequently heard certain clever folk in his own neighbourhood discuss. "The lord of the manor in the part of Sussex whence I come hath a plantation of sixteen fair oak trees, and they be so set out that they make twelve rows with four trees in every row. Once on a time a man of deep learning, who happened to be travelling in those parts, did say that the sixteen trees might have been so planted that they would make so many as fifteen straight rows, with four trees in every row thereof. Can ye show me how this might be? Many have doubted that 'twere possible to be done." The illustration shows one of many ways of forming the twelve rows. How can we make fifteen?

22.—*The Franklin's Puzzle*

"A Franklin was in this company; White was his beard as is the daisy." We are told by Chaucer that he was a great householder and an epicure. "Without baked meat never was his house. Of fish and flesh, and that so plenteous, It snowed in his house of meat and drink, Of every dainty that men could bethink." He was a hospitable and generous man. "His table dormant in his hall alway Stood ready covered all throughout the day." At the repasts of the Pilgrims he usually presided at one of the tables, as we found him doing on the occasion when the cook propounded his problem of the two pies.

One day, at an inn just outside Canterbury, the company called on him to produce the puzzle required of him; whereupon he placed on the table sixteen bottles numbered 1, 2, 3, up to 15, with the last one marked 0. "Now, my masters," quoth he, "it will be fresh in your memories how that the good Clerk of Oxenford did show us a riddle touching what hath been called the magic square. Of a truth will I set before ye another that may seem to be somewhat of a like kind, albeit there be little in common betwixt them. Here be set out sixteen bottles in form of a square, and I pray you so place them afresh that they shall form a magic square, adding up to thirty in all the ten straight ways. But mark well that ye may not remove more than ten of the bottles from their present places, for therein layeth the subtlety of the riddle." This is a little puzzle that may be conveniently tried with sixteen numbered counters.

23.—*The Squire's Puzzle*

The young Squire, twenty years of age, was the son of the Knight that accompanied him on the historic pilgrimage. He was undoubtedly what in later times we should call a dandy, for, "Embroideréd was he as is a mead, All full of fresh flowers, white and red. Singing he was or fluting all the day, He was as fresh as is the month of May." As will be seen in the illustration to No. 26, while the Haberdasher was propounding his problem of the triangle, this young Squire was standing in the background making a drawing of some kind; for "He could songs make and well indite, Joust and eke dance, and well portray and write."

The Knight turned to him after a while and said, "My son, what is it over which thou dost take so great pains withal?" and the Squire answered, "I have bethought me how I might portray in one only stroke a picture of our late sovereign lord King Edward the Third, who hath been dead these ten years. 'Tis a riddle to find where the stroke doth begin and where it doth also end. To him who first shall show it unto me will I give the portraiture."

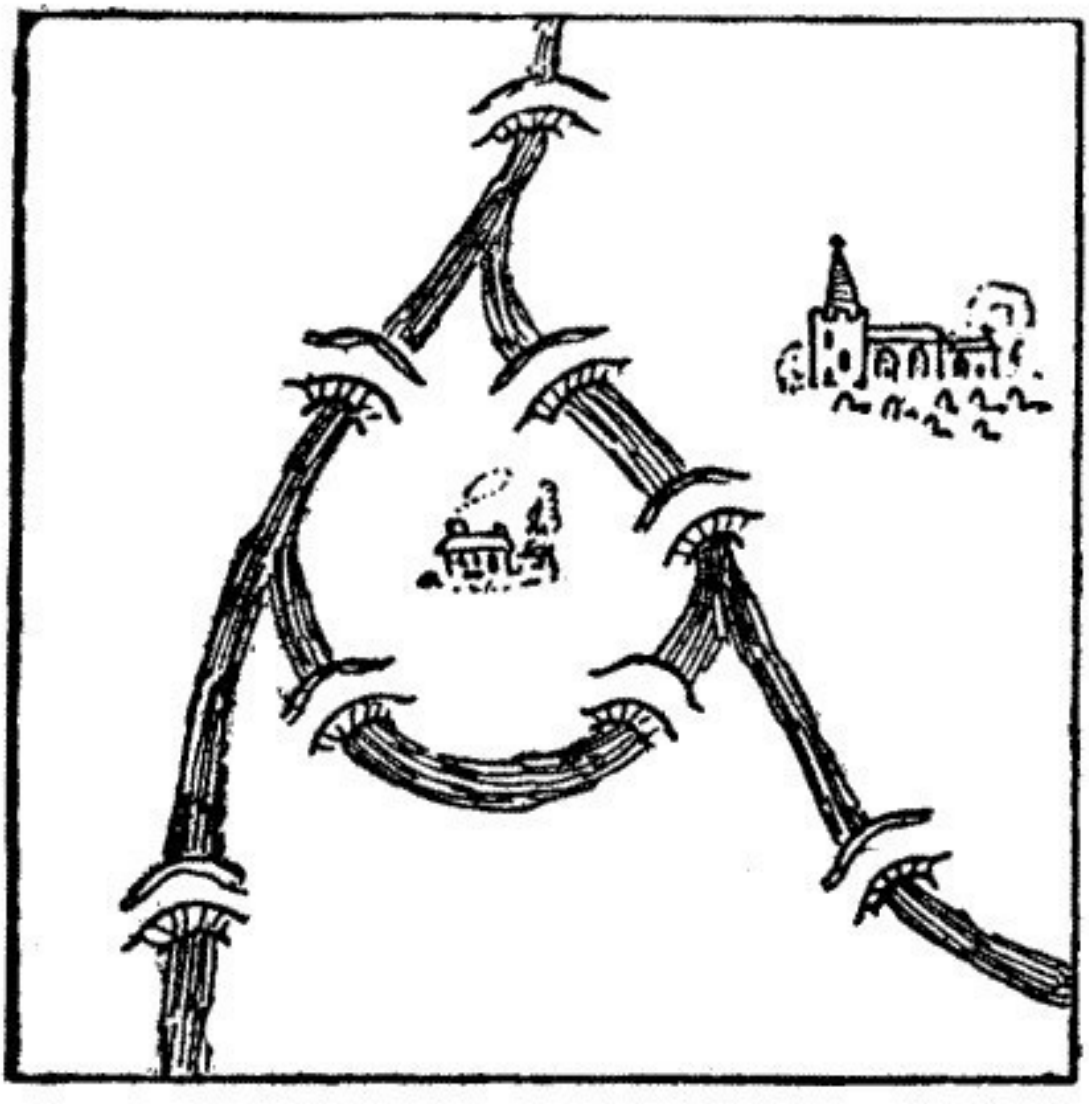
I am able to present a facsimile of the original drawing, which was won by the Man of Law. It may be here remarked that the pilgrimage set out from Southwark on 17th April 1387, and Edward the Third died in 1377.

24.—*The Friar's Puzzle*

The Friar was a merry fellow, with a sweet tongue and twinkling eyes. "Courteous he was and lowly of service. There was a man nowhere so virtuous." Yet he was "the best beggar in all his house," and gave reasons why "Therefore, instead of weeping and much prayer, Men must give silver to the needy friar." He went by the name of Hubert. One day he produced four money bags and spoke as follows: "If the needy friar doth receive in alms five hundred silver pennies, prithee tell in how many different ways they may be placed in the four bags." The good man explained that order made no difference (so that the distribution 50, 100, 150, 200 would be the same as 100, 50, 200, 150, or 200, 50, 100, 150), and one, two, or three bags may at any time be empty.

25.—*The Parson's Puzzle*

The Parson was a really devout and good man. "A better priest I trow there nowhere is." His virtues and charity made him beloved by all his flock, to whom he presented his teaching with patience and simplicity; "but first he followed it himself." Now, Chaucer is careful to tell us that "Wide was his parish, and houses far asunder, But he neglected nought for rain or thunder;" and it is with his parochial visitations that the Parson's puzzle actually dealt. He produced a plan of part of his parish, through which a small river ran that joined the sea some hundreds of miles to the south. I give a facsimile of the plan.



"Here, my worthy Pilgrims, is a strange riddle," quoth the Parson. "Behold how at the branching of the river is an island. Upon this island doth stand my own poor parsonage, and ye may all see the whereabouts of the village church. Mark ye, also, that there be eight bridges and no more over the river in my parish. On my way to church it is my wont to visit sundry of my flock, and in the doing thereof I do pass over every one of the eight bridges once and no more. Can any of ye find the path, after this manner, from the house to the church, without going out of the parish? Nay, nay, my friends, I do never cross the river in any boat, neither by swimming nor wading, nor do I go underground like

unto the mole, nor fly in the air as doth the eagle; but only pass over by the bridges." There is a way in which the Parson might have made this curious journey. Can the reader discover it? At first it seems impossible, but the conditions offer a loophole.

26.—*The Haberdasher's Puzzle*

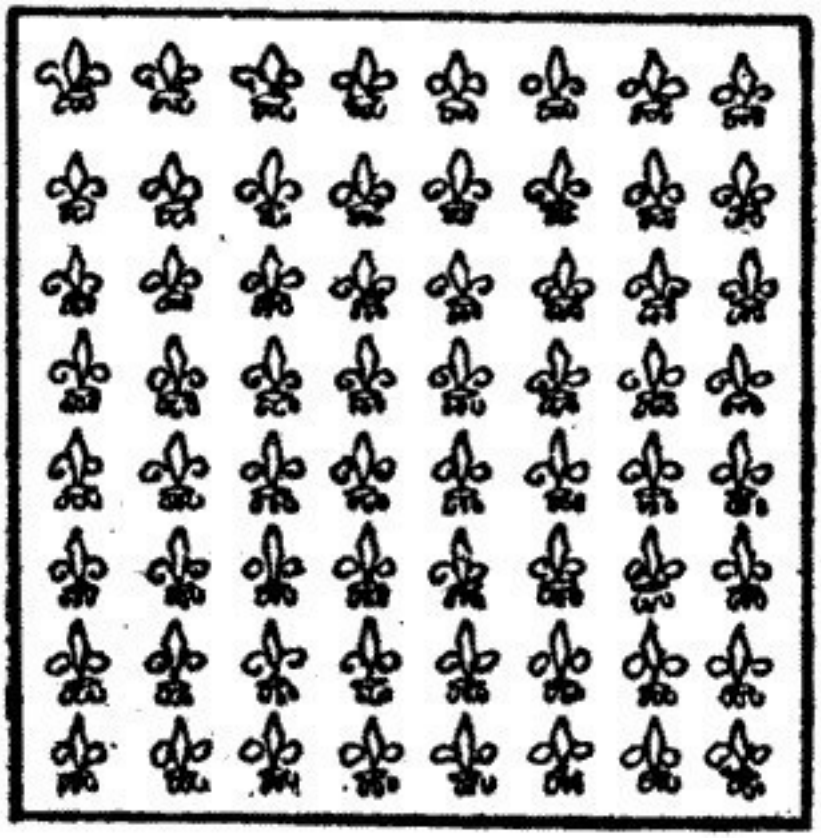
Many attempts were made to induce the Haberdasher, who was of the party, to propound a puzzle of some kind, but for a long time without success. At last, at one of the Pilgrims' stopping-places, he said that he would show them something that would "put their brains into a twist like unto a bell-rope." As a matter of fact, he was really playing off a practical joke on the company, for he was quite ignorant of any answer to the puzzle that he set them. He produced a piece of cloth in the shape of a perfect equilateral triangle, as shown in the illustration, and said, "Be there any among ye full wise in the true cutting of cloth? I trow not. Every man to his trade, and the scholar may learn from the varlet and the wise man from the fool. Show me, then, if ye can, in what manner this piece of cloth may be cut into four several pieces that may be put together to make a perfect square."

Now some of the more learned of the company found a way of doing it in five pieces, but not in four. But when they pressed the Haberdasher for the correct answer he was forced to admit, after much beating about the bush, that he knew no way of doing it in any number of pieces. "By Saint Francis," saith he, "any knave can make a riddle methinks, but it is for them that may to rede it aright." For this he narrowly escaped a sound beating. But the curious point of the puzzle is that I have found that the feat may really be performed in so few as four pieces, and without turning over any piece when placing them together. The method of doing this is subtle, but I think the reader will find the problem a most interesting one.

27.—*The Dyer's Puzzle*

One of the pilgrims was a Dyer, but Chaucer tells us nothing about him, the Tales being incomplete. Time after time the company had pressed this individual to produce a puzzle of some kind, but without effect. The poor fellow tried his best to follow the examples of his friends the Tapiser, the Weaver, and the Haberdasher; but the necessary idea would not come, rack his brains as he would. All things, however, come to those who wait—and persevere—and one morning he announced, in a state of considerable excitement, that he had a poser to set before them. He brought out a square piece of silk on which were embroidered a number of fleurs-de-lys in rows, as shown in our illustration.

"Lordings," said the Dyer, "hearken anon unto my riddle. Since I was awakened at dawn by the crowing of cocks—for which din may our host never thrive—I have sought an answer thereto, but by St. Bernard I have found it not. There be sixty-and-four flowers-de-luce, and the riddle is to show how I may remove six of these so that there may yet be an even number of the flowers in every row and every column."



The Dyer was abashed when every one of the company showed without any difficulty whatever, and each in a different way, how this might be done. But the good Clerk of Oxenford was seen to whisper something to the Dyer, who added, "Hold, my masters! What I have said is not all. Ye must find in how many different ways it may be done!" All agreed that this was quite another matter. And only a few of the company got the right answer.

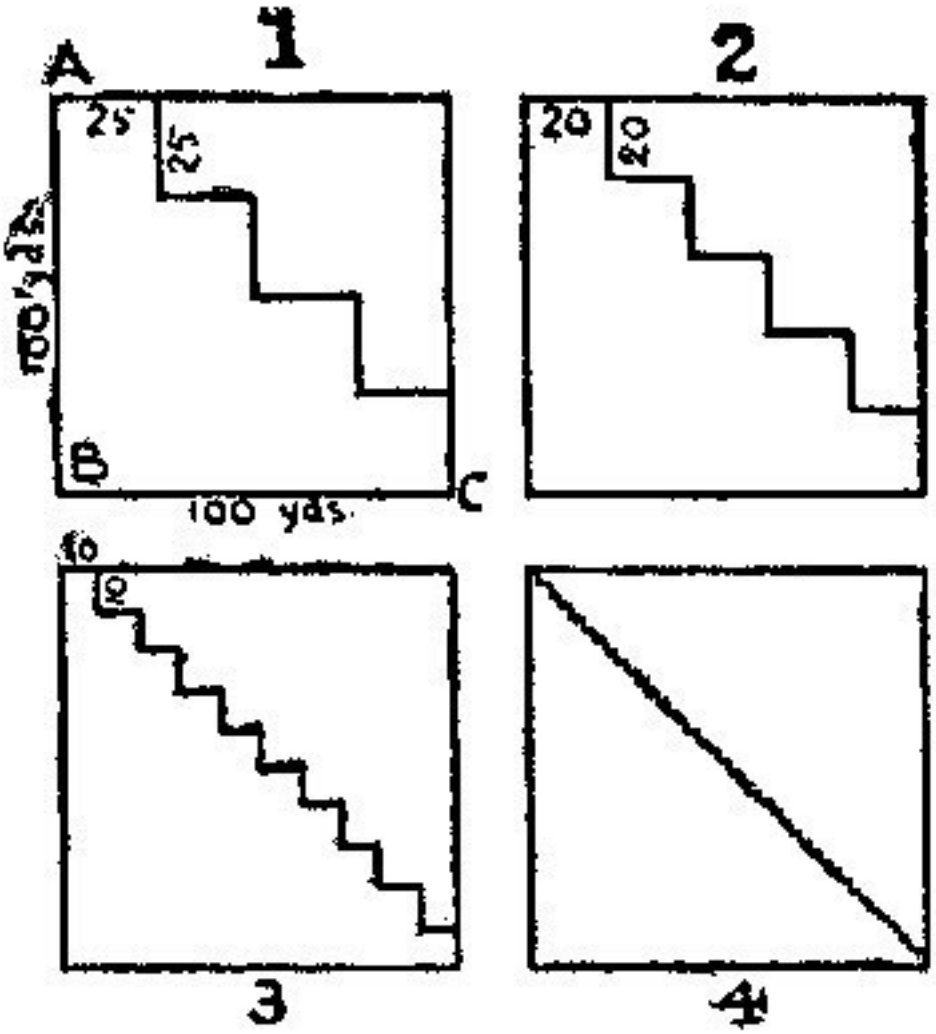
28.—*The Great Dispute between the Friar and the Sompnour*

Chaucer records the painful fact that the harmony of the pilgrimage was broken on occasions by the quarrels between the Friar and the Sompnour. At one stage the latter threatened that ere they reached Sittingbourne he would make the Friar's "heart for to mourn;" but the worthy Host intervened and patched up a temporary peace. Unfortunately trouble broke out again over a very curious dispute in this way.

At one point of the journey the road lay along two sides of a square field, and some of the pilgrims persisted, in spite of trespass, in cutting across from corner to corner, as they are seen to be doing in the illustration. Now, the Friar startled the company by stating that there was no need for the trespass, since one way was exactly the same distance as the other! "On my faith, then," exclaimed the Sompnour, "thou art a very fool!" "Nay," replied the Friar, "if the company will but listen with patience, I shall presently show how that thou art the fool, for thou hast not wit enough in thy poor brain to prove that the diagonal of any square is less than two of the sides."

If the reader will refer to the diagrams that we have given, he will be able to follow the Friar's argument. If we suppose the side of the field to be 100 yards, then the distance along the two sides, A to B, and B to C, is 200 yards. He undertook to prove that the diagonal distance direct from A to C is also 200 yards. Now, if we take the diagonal path shown in Fig. 1, it is evident that we go the same distance, for every one of the eight straight portions of this path measures exactly 25 yards. Similarly in Fig. 2, the zigzag contains ten straight portions, each 20 yards long: that path is also the

same length—200 yards. No matter how many steps we make in our zigzag path, the result is most certainly always the same. Thus, in Fig. 3 the steps are very small, yet the distance must be 200 yards; as is also the case in Fig. 4, and would yet be if we needed a microscope to detect the steps. In this way, the Friar argued, we may go on straightening out that zigzag path until we ultimately reach a perfectly straight line, and it therefore follows that the diagonal of a square is of exactly the same length as two of the sides.



Now, in the face of it, this must be wrong; and it is in fact absurdly so, as we can at once prove by actual measurement if we have any doubt. Yet the Sompnour could not for the life of him point out the fallacy, and so upset the Friar's reasoning. It was this that so exasperated him, and consequently, like many of us to-day when we get entangled in an argument, he utterly lost his temper and resorted to abuse. In fact, if some of the other pilgrims had not interposed the two would have undoubtedly come to blows. The reader will perhaps at once see the flaw in the Friar's argument.

29.—*Chaucer's Puzzle*

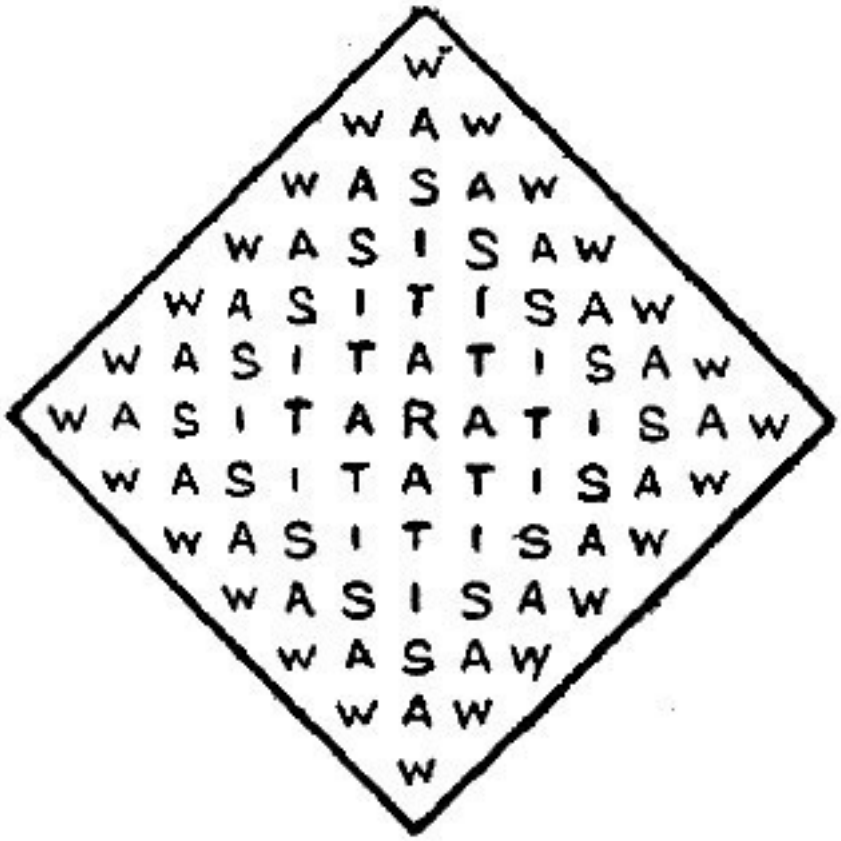
Chaucer himself accompanied the pilgrims. Being a mathematician and a man of a thoughtful habit, the Host made fun of him, he tells us, saying, "Thou lookest as thou wouldst find a hare, For ever on the ground I see thee stare." The poet replied to the request for a tale by launching into a long-spun-out and ridiculous poem, intended to ridicule the popular romances of the day, after twenty-two stanzas of which the company refused to hear any more, and induced him to start another tale in prose. It is an interesting fact that in the "Parson's Prologue" Chaucer actually introduces a little astronomical problem. In modern English this reads somewhat as follows:—

"The sun from the south line was descended so low that it was not to my sight more than twenty-nine degrees. I calculate that it was four o'clock, for, assuming my height to be six feet, my shadow was eleven feet, a little more or less. At the same moment the moon's altitude (she being in mid-Libra) was steadily increasing as we entered at the west end of the village." A correspondent has taken the trouble to work this out, and finds that the local time was 3.58 p.m., correct to a minute, and that the day of the year was the 22nd or 23rd of April, modern style. This speaks well for Chaucer's accuracy, for the first line of the Tales tells us that the pilgrimage was in April—they are supposed to have set out on 17th April 1387, as stated in No. 23.

Though Chaucer made this little puzzle and recorded it for the interest of his readers, he did not venture to propound it to his fellow-pilgrims. The puzzle that he gave them was of a simpler kind altogether: it may be called a geographical one. "When, in the year 1372, I did go into Italy as the envoy of our sovereign lord King Edward the Third, and while there did visit Francesco Petrarch, that learned poet did take me to the top of a certain mountain in his country. Of a truth, as he did show me, a mug will hold less liquor at the top of this mountain than in the valley beneath. Prythee tell me what mountain this may be that has so strange a property withal." A very elementary knowledge of geography will suffice for arriving at the correct answer.

30.—*The Puzzle of the Canon's Yeoman*

This person joined the party on the road. "'God save,' quoth he, 'this jolly company! Fast have I ridden,' saith he, 'for your sake, Because I would I might you overtake, To ride among this merry company.'" Of course, he was asked to entertain the pilgrims with a puzzle, and the one he propounded was the following. He showed them the diamond-shaped arrangement of letters presented in the accompanying illustration, and said, "I do call it the rat-catcher's riddle. In how many different ways canst thou read the words, 'Was it a rat I saw?'" You may go in any direction backwards and forwards, upwards or downwards, only the successive letters in any reading must always adjoin one another.



31.—*The Manciple's Puzzle*

The Manciple was an officer who had the care of buying victuals for an Inn of Court—like the Temple. The particular individual who accompanied the party was a wily man who had more than thirty masters, and made fools of them all. Yet he was a man "whom purchasers might take as an example How to be wise in buying of their victual."

It happened that at a certain stage of the journey the Miller and the Weaver sat down to a light repast. The Miller produced five loaves and the Weaver three. The Manciple coming upon the scene asked permission to eat with them, to which they agreed. When the Manciple had fed he laid down eight pieces of money and said with a sly smile, "Settle betwixt yourselves how the money shall be fairly divided. 'Tis a riddle for thy wits."

A discussion followed, and many of the pilgrims joined in it. The Reve and the Sompnour held that the Miller should receive five pieces and the Weaver three, the simple Ploughman was ridiculed for suggesting that the Miller should receive seven and the Weaver only one, while the Carpenter, the Monk, and the Cook insisted that the money should be divided equally between the two men. Various other opinions were urged with considerable vigour, until it was finally decided that the Manciple, as an expert in such matters, should himself settle the point. His decision was quite correct. What was it? Of course, all three are supposed to have eaten equal shares of the bread.

PUZZLING TIMES AT SOLVAMHALL CASTLE

Everybody that has heard of Solvamhall Castle, and of the quaint customs and ceremonies that obtained there in the olden times, is familiar with the fact that Sir Hugh de Fortibus was a lover of all kinds of puzzles and enigmas. Sir Robert de Riddlesdale himself declared on one occasion, "By the bones of Saint Jingo, this Sir Hugh hath a sharp wit. Certes, I wot not the riddle that he may not rede withal." It is, therefore, a source of particular satisfaction that the recent discovery of some ancient rolls and documents relating mainly to the family of De Fortibus enables me to place before my readers a few of the posers that racked people's brains in the good old days. The selection has been made to suit all tastes, and while the majority will be found sufficiently easy to interest those who like a puzzle that *is* a puzzle, but well within the scope of all, two that I have included may perhaps be found worthy of engaging the attention of the more advanced student of these things.

32.—*The Game of Bandy-Ball*

Bandy-ball, cambuc, or goff (the game so well known to-day by the name of golf), is of great antiquity, and was a special favourite at Solvamhall Castle. Sir Hugh de Fortibus was himself a master of the game, and he once proposed this question.

They had nine holes, 300, 250, 200, 325, 275, 350, 225, 375, and 400 yards apart. If a man could always strike the ball in a perfectly straight line and send it exactly one of two distances, so that it would either go towards the hole, pass over it, or drop into it, what would the two distances be that would carry him in the least number of strokes round the whole course?

"Beshrew me," Sir Hugh would say, "if I know any who could do it in this perfect way; albeit, the point is a pretty one."

Two very good distances are 125 and 75, which carry you round in 28 strokes, but this is not the correct answer. Can the reader get round in fewer strokes with two other distances?

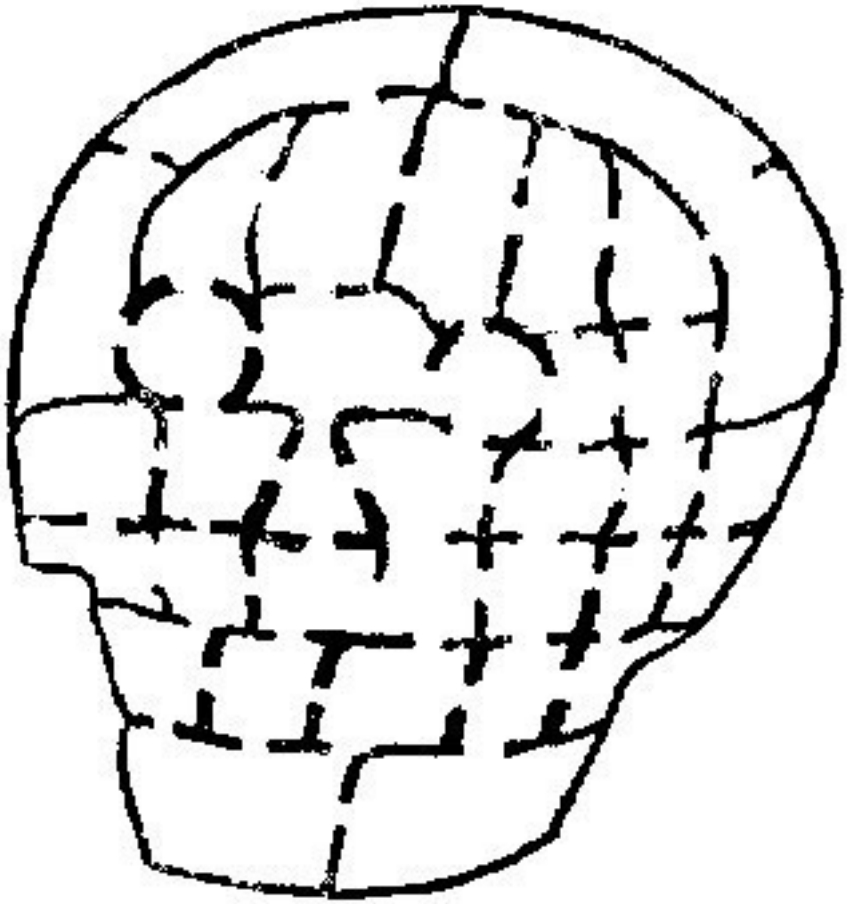
33.—*Tilting at the Ring*

Another favourite sport at the castle was tilting at the ring. A horizontal bar was fixed in a post, and at the end of a hanging supporter was placed a circular ring, as shown in the above illustrated title. By raising or lowering the bar the ring could be adjusted to the proper height—generally about the level of the left eyebrow of the horseman. The object was to ride swiftly some eighty paces and run the lance through the ring, which was easily detached, and remained on the lance as the property of the skilful winner. It was a very difficult feat, and men were not unnaturally proud of the rings they had succeeded in capturing.

At one tournament at the castle Henry de Gournay beat Stephen Malet by six rings. Each had his rings made into a chain—De Gournay's chain being exactly sixteen inches in length, and Malet's six inches. Now, as the rings were all of the same size and made of metal half an inch thick, the little puzzle proposed by Sir Hugh was to discover just how many rings each man had won.

34.—*The Noble Demoiselle*

Seated one night in the hall of the castle, Sir Hugh desired the company to fill their cups and listen while he told the tale of his adventure as a youth in rescuing from captivity a noble demoiselle who was languishing in the dungeon of the castle belonging to his father's greatest enemy. The story was a thrilling one, and when he related the final escape from all the dangers and horrors of the great Death's-head Dungeon with the fair but unconscious maiden in his arms, all exclaimed, "'Twas marvellous valiant!" But Sir Hugh said, "I would never have turned from my purpose, not even to save my body from the bernicles."

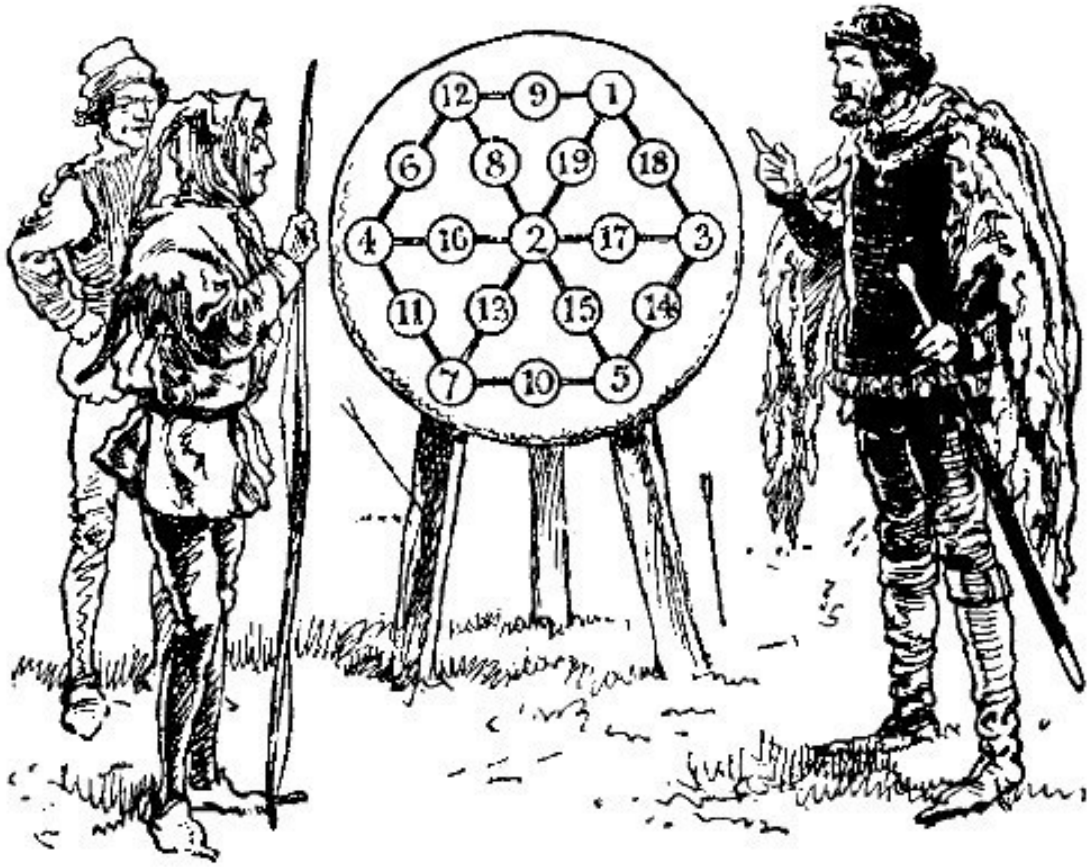


Sir Hugh then produced a plan of the thirty-five cells in the dungeon and asked his companions to discover the particular cell that the demoiselle occupied. He said that if you started at one of the outside cells and passed through every doorway once, and once only, you were bound to end at the cell that was sought. Can you find the cell? Unless you start at the correct outside cell it is impossible to pass through all the doorways once and once only. Try tracing out the route with your pencil.

35.—*The Archery Butt*

The butt or target used in archery at Solvamhall was not marked out in concentric rings as at the present day, but was prepared in fanciful designs. In the illustration is shown a numbered target prepared by Sir Hugh himself. It is something of a curiosity, because it will be found that he has so cleverly arranged the numbers that every one of the twelve lines of three adds up to exactly twenty-two.

One day, when the archers were a little tired of their sport, Sir Hugh de Fortibus said, "What ho, merry archers! Of a truth it is said that a fool's bolt is soon shot, but, by my faith, I know not any man among you who shall do that which I will now put forth. Let these numbers that are upon the butt be set down afresh, so that the twelve lines thereof shall make twenty and three instead of twenty and two."



To rearrange the numbers one to nineteen so that all the twelve lines shall add up to twenty-three will be found a fascinating puzzle. Half the lines are, of course, on the sides, and the others radiate from the centre.

36.—*The Donjon Keep Window*

On one occasion Sir Hugh greatly perplexed his chief builder. He took this worthy man to the walls of the donjon keep and pointed to a window there.

"Methinks," said he, "yon window is square, and measures, on the inside, one foot every way, and is divided by the narrow bars into four lights, measuring half a foot on every side."

"Of a truth that is so, Sir Hugh."

"Then I desire that another window be made higher up whose four sides shall also be each one foot, but it shall be divided by bars into eight lights, whose sides shall be all equal."

"Truly, Sir Hugh," said the bewildered chief builder, "I know not how it may be done."

"By my halidame!" exclaimed De Fortibus in pretended rage, "let it be done forthwith. I trow thou art but a sorry craftsman if thou canst not, forsooth, set such a window in a keep wall."

It will be noticed that Sir Hugh ignores the thickness of the bars.

37.—*The Crescent and the Cross*

When Sir Hugh's kinsman, Sir John de Collingham, came back from the Holy Land, he brought with him a flag bearing the sign of a crescent, as shown in the illustration. It was noticed that De Fortibus spent much time in examining this crescent and comparing it with the cross borne by the Crusaders on their own banners. One day, in the presence of a goodly company, he made the following striking announcement:—

"I have thought much of late, friends and masters, of the conversion of the crescent to the cross, and this has led me to the finding of matters at which I marvel greatly, for that which I shall now make known is mystical and deep. Truly it was shown to me in a dream that this crescent of the enemy may be exactly converted into the cross of our own banner. Herein is a sign that bodes good for our wars in the Holy Land."

Конец ознакомительного фрагмента.