

quarter of our worlds would occupy a space equal to the whole size of the sun.

Some years ago, when I was lecturing on this subject, I thought of demonstrating this to my pupils by bringing in a sack a million and a quarter of peas and pouring them on the table, each pea to represent a world, and all of them the number of worlds required to measure the sun.

In order to be correct, I bought half a pint of peas, and counted them, in order to learn how many pints for the million and a quarter. I found that instead of a sack, I should require a horse and cart. There were one thousand two hundred peas in a pint, about ten thousand in a gallon, and, therefore, I required one hundred and twenty-five gallons, or more than half a ton of peas to represent the size of the sun, each pea representing a world.

I use world-measure rather than mile-measure, because miles are too small. Another comparison may help to convey an idea of the size of the sun. You know that the moon is far away from us, two hundred and forty thousand miles. It sweeps round the earth in a nearly circular orbit of four hundred and eighty thousand miles across.

This is a magnitude too great for the human mind fairly to grasp, but great as it is, if the earth were at the sun's centre and the moon still circling round it, the orbit of the moon would reach but a little more than half way to the sun's surface.

I have said all this about the size of the sun, because it is necessary to keep his enormous magnitude in mind, in order to form any just conception of the mighty doings I am now about to describe.

Let us begin with the spots to which I have already alluded. These have been carefully observed and studied, and prove to be great holes. Nobody can tell how deep they are, but the length and breadth of the mouth of these great pits have been well and accurately measured. A very small spot, requiring a powerful telescope to show it, must be more than a thousand miles in diameter.

Those that are visible without a telescope to ordinary eyes protected by a dark glass or a hazy atmosphere must be, at least, thirty thousand miles across. One was observed in 1858 which had a breadth of more than one hundred and forty-three thousand miles. A string of eighteen of our worlds would be required to span it. Into its vast concavity worlds like ours might be poured by hundreds as we should pour peas into a basin.

Holes or cavities in what? you will ask. Certainly not in anything solid like the crust of the earth. We know this, because the surface of the sun is in continual motion, and different parts of that surface move with different velocities. A solid cannot do this without tearing itself to pieces.

The spots themselves move about on the surface of the sun, change their forms and sizes, grow and diminish, open and close, disappear altogether.

The surface of the sun is evidently gaseous. Whatever may be the condition of the interior, that surface visible to us is a fiery atmosphere of vast depth, and below it is something less luminous which is revealed by the spots, the central or deepest parts of which appear black, and this apparent blackness shades off towards the rim of the cavity.

I say "apparent," because such blackness is only due to contrast and the obscuration of the dark glasses through which the sun is seen. Compared with anything on the earth the darkest parts of the spots are very brilliant. The spots thus appear to be huge eddies or whirlpools in the flaming atmospheric ocean of the sun.

Further examination reveals the existence of mighty billows on this flaming ocean. The largest of these waves have been named faculae. They are great heapy ridges of the flaming matter, many of them thirty to forty thousand miles long, and one to four thousand miles wide. They are specially abundant round about the spots, as though the spots are centres of inconceivably furious storms or tornadoes.

These great billows roll along the surface of the sun with velocities proportionate to their magnitude, thousands of miles an hour. Sometimes they are seen passing over the edge of the sun's disc, and projecting like a little tooth. To be thus visible they must be, at least, forty or fifty

times as high as the highest mountain on this earth.

But these are not all. A powerful telescope shows the whole surface of the sun to be mottled with lesser waves, ripples on the fiery ocean; but the smallest of these that are visible, must be far larger than the biggest of the Rocky Mountains or of the Alps or Himalayas. These also are in rapid motion, showing that the sun is everywhere in a state of perpetual raging storm, of fury inconceivable, incomparably exceeding any of the tempests on our quiet little globe.

When the moon happens to pass directly between us and the sun we have a solar eclipse. The body of the sun may thus be quite hidden while the outer fringes of his luminous atmosphere are still uncovered. More marvels are revealed thereby. There was such an eclipse in 1842, and the astronomers throughout the world were much excited by an amount of red flames or clouds that seemed to project from the dark edge of the moon, and might either belong to the moon itself or be projections from the sun behind it.

Could they be volcanic eruptions on the moon? If they belonged to the sun they must, to be thus visible at such a distance, be of enormous magnitude, forty or fifty thousand miles high above the solar surface. Many believed them to be optical illusions, fictions of the imagination.

But between 1842 and 1860 photography had been so far perfected as to enable Mr. De la Rue to take pictures with materials that have no imagination and cannot be deceived. He not only proved their actual existence, but also that they belonged to the sun. He took several photographs showing that as the moon moved across the face of the sun, it covered over those on the side towards which it was advancing, and uncovered others on the side it was leaving.

Since this, a method has been discovered by which these mysterious appendages can be seen without an eclipse. They have been studied with great care by astronomers both in Europe and America. In Italy there is a society specially organized for studying them, and the revelations thus obtained are still more marvellous than what I have already told you concerning the tempest and tornadoes of the sun.

They are due to tremendous explosions, compared to one of which, the combined bombardment of a hundred millions of our biggest cannons all fired at once would be but the effort of a boy's pea-shooter or pop-gun.

#### HOW WILL IT APPEAR?

A writer in the *Christian Guardian* says:—When I was pastor of the Box Grove church, a man told me his annual expenditure for tobacco was at least \$20. He was a poor man. If he should give up this habit, and give that amount to the cause of God, how many people would object, and say he was robbing his family. A class-leader on one of my circuits was assuring me that he could not afford to give even one dollar to help the missionary work of the church; yet at the same time, he was smoking at the rate of, I judge, from \$12 to \$20 per year. That man would lead a class, teach in the Sunday-school, and pray for the spread of the Gospel; and yet, while smoking perhaps \$20 per year, claimed not to be able to give even one to the glorious work of spreading abroad the blessed Gospel. I once heard an official member say it cost him \$50 per year for tobacco. That same evening, in the missionary meeting, he signed \$3. Think of it, \$50 for tobacco and \$3 for Christ's cause! When I was on the Bradford district, we had an official member whose annual subscription to the funds of his circuit was \$7. He told me his tobacco cost him every year \$14. Then the amounts sometimes spent for liquors by some who call themselves Christians, we hesitate to speak of. How will such expenditure appear in the day of judgment? In how many ways we can economize, and thus help the cause of God if our hearts are fired with his love.

#### TEMPERANCE IN ALL THINGS.

A correspondent of the *Woman's Journal*, writing upon "relation of food to liquor-drinking," offers the following suggestive thoughts:

"Do we realize as we ought that much

of the food placed upon our tables tends to the dominion of appetite?"

"Would that temperance advocates were 'temperate in all things.' We 'draw the line' at wine, beer, and distilled liquor; and inside that line, we lay the reins on the neck of appetite, and let it carry us whither it will.

"Suppose I were to say, 'I'm not well to-day. I was out last night, and we got to drinking brandy; and I suppose I took too much, and I am down to-day.' Wouldn't you be shocked? But suppose I said, 'I have a fearful headache, I ate cake and ice cream at the social last night, and knew at the same time I'd pay for it.' Or, 'I dined with Mrs. A. yesterday and ate some of her spiced pickles, delicious mince pie; they always make me sick, but I am so fond of them I can't let them alone.'

"Did you ever hear temperance men and women say anything like that?"

"I have,—and without a tinge of shame at the confession.

"True, such indulgence does not so greatly benumb the higher faculties, and deprave the nature as does indulgence in strong drink. Yet while appetite sways,—in all that is true, and pure, and noble, we live far below our possibilities."—*Exchange.*

#### SCHOLARS' NOTES.

(From *International Question Book*.)

#### LESSON IX.—JUNE 2.

JESUS BEFORE THE COUNCIL.—Mark 14: 56-65.

COMMIT VERSES 55, 56.

GOLDEN TEXT.

They hated me without a cause.—John 15: 25.

CENTRAL TRUTH.

Innocence acting nobly in the presence of enemies.

DAILY READINGS.

M. Mark 14: 55-65.  
T. Matt. 26: 59-68.  
W. Mark 14: 66-72.  
Th. Luke 22: 54-71.  
F. John 18: 15-27.  
Sa. Ps. 2: 1-12.  
Su. Acts 7: 7-15.

#### HELPS OVER HARD PLACES.

55. *Council*: The Jewish Sanhedrim, or court. This was not a regular meeting, because they could not lawfully meet till sunrise. *To death*: not to ascertain the truth, but to kill him. 58. *I will destroy*: he had not said so; see John 2: 19. 60. *High priest*: Caiaphas. 61. *Heid his peace*: because it was useless to those who were determined to pervert everything he said. *Said unto him*: see Matt. 26: 63. He put him under oath, and compelled him to criminate himself. *Son of the Blessed*: i.e., Son of God. 62. *And Jesus said, I am to be silent now* would be to deny the truth. *Sitting on the right hand of power*: omnipotent, having all power under his control. *Coming in the clouds of heaven*: as promised in Matt. 16: 27, 28, should take place in that generation, and hence occurring at the destruction of Jerusalem. Also and more fully on the Judgment Day, at the end of the world. 63. *Rent his clothes*: see 2 Kings 18: 37. Originally a natural outburst of grief, but later it became a mere form, regulated by law. 64. *Blasphemy*: had he not been the Messiah, it would have been blasphemy. *Condemned him*: the execution of the sentence belonged to the Roman government. 65. *Prophecy*: i.e., tell us while blindfolded who struck thee. (See Luke 22: 64.)

SUBJECT: JESUS IN THE PRESENCE OF HIS ENEMIES.

QUESTIONS.

I. THE TRIBUNAL (v. 56). Before whom was Jesus tried? (See also Matt. 26: 57.) What can you tell about the Sanhedrim? Was this a regular meeting? (See Helps.) What kind of witnesses did they seek? If they had sought to know the truth, what kind of witnesses could they have found in abundance? (Luke 7: 21, 22.)

II. THE ACCUSATION (vs. 56-59).—What kind of witnesses first appeared against Jesus? How many witnesses were necessary? (Deut. 19: 15.) Of what did they accuse Jesus? (v. 61.) What was the punishment of blasphemy? (John 19: 7; Lev. 24: 16.) What further accusation did they bring against him afterwards before Pilate? (Luke 23: 2.) What did two at last say they had heard? Was their report true? When had Jesus said something like it? (John 2: 19-22.) What were the differences between the report and the facts?

III. THE PRISONER (vs. 60-64). What did Jesus say in answer to this accusation? Why did he keep silence? (See Isa. 53: 7.) What did the high priest then demand under oath? (See Matt. 26: 63.) Who is meant by the "Blessed"? What was Jesus' reply? What change would take place some day in the relations of Jesus and the chief priests? For what was Jesus now condemned? Would his claims have been blasphemy if they had been false? To what hour did they now adjourn? (Luke 22: 66.) What characteristics of Jesus do you find in this account? Should we sometimes keep silence when falsely accused? What time is referred to in vs. 62? Meaning of rending the garments?

IV. PETER'S DENIALS. Where was Peter all this time? (John 18: 15-18.) Doing what? Retelling the story of Peter's denying Christ. (Mark 14: 60-72.) How long a time was the trial continued? (Luke 22: 59.) What recalled Peter to his right mind? (Mark 14: 72.) How did Peter

repent? What shows the difference between his repentance and that of Judas?

V. JESUS MOCKED (v. 65). How was Jesus treated while waiting for the Sanhedrim to gather legally? Why did they treat him so? Are there any such mockers now? Is it mean as well as wicked to ill-treat those in our power? How do you treat Jesus?

#### PRACTICAL SUGGESTIONS.

I. Unbelievers try to find, not the truth about the Bible, but some fault in it.

II. To do this they pervert and distort its truths.

III. It is wise to be silent under false accusations before those who are determined to pervert everything said. Do not cast pearls before swine.

#### LESSON X.—JUNE 9.

JESUS BEFORE PILATE.—MARK 15: 1-20.

COMMIT VERSES 14, 15.

GOLDEN TEXT.

Pilate saith unto them, Take ye him, and crucify him.—John 19: 6.

CENTRAL TRUTH.

Each person must decide what he will do with Jesus.

DAILY READINGS.

M. Mark 15: 1-20.  
T. Matt. 27: 1-31.  
W. Luke 22: 66-71.  
Th. Luke 23: 1-25.  
F. John 18: 28-40.  
Sa. John 19: 1-16.  
Su. Matt. 6: 19-34.

#### HELPS OVER HARD PLACES.

1. *Held a consultation*: the meeting of the Sanhedrim in the morning to condemn Jesus, which could not be done at their night-session (last lesson). *Carried him away*: because they had no power to put him to death. *Pilate*: the governor of the Jews, under Tiberius, the Emperor of Rome. 2. *Thou sayest*: a strong way of saying, I am. 3. *Accused of many things*: sedition, refusing to pay tribute, treason against Caesar, making trouble. 5. *Answered nothing*: (1) because it was of no use; (2) his life was a sufficient answer. 7. *Barabbas*: a leader in a rebellion or riot against Rome. 11. *But the chief priests, etc.*: while the people were deliberating, Pilate's wife sent her warning. 14. *Pilate, Judas, Herod, Pilate's wife, the centurion*—all agreed on the innocence of Jesus. 16. *Pretorium*: the court or hall where the pretor or governor held trials and transacted business. 17. *Clothed him with purple*: the dress of kings, probably one of the soldier's red cloaks answered the purpose. This was the third mockery of Jesus.

SUBJECT: WHAT SHALL WE DO WITH JESUS.

QUESTIONS.

I. WHAT THE RULERS DID (v. 1).—When did the Sanhedrim meet again? What had they decided should be done with Jesus? (14: 64.) Where did they next send Jesus? What was their object in this? (John 18: 31, 32.) Why were the chief priests so anxious to destroy Jesus?

II. WHAT PILATE DID (vs. 2-5).—Who was Pilate? What can you tell about him? Of what did the Jews accuse Jesus to Pilate? (Luke 23: 2, 5.) Why did Pilate ask Jesus? The reply? In what sense was Jesus King of the Jews? How did Jesus explain his position? (John 18: 33-38.) Why did Jesus after this keep silence? Where did Pilate send Jesus at this time? (Luke 23: 6-12.) On his return, did Pilate find Jesus innocent or guilty? (Luke 23: 13-16.) Who sent a warning message to Pilate? (Matt. 27: 19.) In what way did Pilate try to throw off the guilt of his wrong decision? (Matt. 27: 24, 25.) What finally decided Pilate? (John 19: 12.) Did Pilate gain anything by his wrong doing? (Pilate not long after this was recalled to Rome, and died in banishment.) Can we ever make any real gain by means of wrong doing?

III. WHAT THE PEOPLE DID (vs. 6-14).—What was a peculiar custom of Pilate's at the Pass-over? Whom did he wish to release? Whom did the people choose? Who was Barabbas? How could they choose such a man instead of Jesus? When do we make a similar choice? What suffering came upon them for this wicked choice?

IV. WHAT THE SOLDIERS DID (vs. 15-20).—What did Pilate do at last? How did the soldiers treat Jesus after the scourging? What made them mock him? Is it mean as well as wicked to ill-treat the weak and unfortunate? Is it especially mean to mock and reproach them?

V. WHAT WE SHOULD DO WITH JESUS.—Can we help doing something with Jesus? Between what and Jesus must we make a choice? Will laying the blame on other people save us from the responsibility of our decision? What will be the result of deciding against Jesus? What should we do with Jesus? What blessings will follow our choice of him?

#### PRACTICAL SUGGESTIONS.

I. Jesus a King in disguise, as are often Truth, Justice, Reformers.

II. Like Pilate, we have many warnings not to reject Christ.

III. We must do something with Christ,—either accept or reject him.

#### LESSON CALENDAR.

(Second Quarter, 1889.)

- Apr. 7.—The Triumphal Entry.—Mark 11: 1-11.
- Apr. 14.—The Rejected Son.—Mark 12: 1-12.
- Apr. 21.—The Two Great Commandments.—Mark 12: 28-34.
- Apr. 28.—Destruction of the Temple Foretold.—Mark 13: 1-13.
- May 5.—The Command to Watch.—Mark 13: 24-37.
- May 12.—The Anointing at Bethany.—Mark 14: 1-9.
- May 19.—The Lord's Supper.—Mark 14: 12-26.
- May 26.—Jesus betrayed.—Mark 14: 43-54.
- June 2.—Jesus Before the Council.—Mark 14: 55-65.
- June 9.—Jesus Before Pilate.—Mark 15: 1-20.
- June 16.—Jesus Crucified.—Mark 15: 21-39.
- June 23.—Jesus Risen.—Mark 16: 1-13.
- June 30.—Review, Missions, and Temperance.—1 Cor. 8: 4-13.