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I.—THE REUNION OF CHRISTENDOM.

The subject of this paper has been a good deal discussed and written about of late years. And yet it is not altogether new. Ever since the great schism in the eighth century between the Greek and Latin Churches repeated attempts have been made to effect a reunion. Since the Reformation several abortive attempts have been made to effect even partial reunion. One of the latest of these was the proposal set forth in the celebrated Lambeth Quadrilateral or the four propositions of the Convocation of English and American Bishops at Lambeth. The Northern Assembly appointed a very respectable committee to meet with a similar committee of the American Episcopal Church, and for two or three years they held a number of very pleasant joint meetings. But no real progress was made, and very few real Presbyterians ever expected any results of any value. None of the proposed articles were entirely satisfactory, but the insuperable difficulty was in the last one. Presbyterians would not object to the truly primitive and scriptural episcopate, which is the parochial episcopate, but it was obvious from the first that the Episcopalians meant the later diocesan or prelatical episcopate, and that is what Presbyterians will never accept, and they would cease to be Presbyterians if they did. It was, therefore, no more than might have been expected when the General Assembly at Saratoga in 1894 dismissed their committee and discontinued further fruitless negotiations.

The subject of union, however, still continues to be dis-

IV. PUZZLING QUESTIONS.

1. My pupils in mathematics once and again brought me an old algebraic puzzle, with which some of my readers are doubtless familiar. It is universally held and taught that if A square minus B square be divided by A minus B , the quotient will be A plus B . This is true arithmetically as well. For instance, if A equals 6, and B equals 4, we have 36 minus 16, or 20, divided by 6 minus 4, or 2, equal to 10, which is equal to 6 plus 4. Any number of similar examples could be given, all as simple as this. The trouble arises when we make A and B equal. Thus if each equals 6, we have 36 minus 36, or 0, divided by 6 minus 6, or 0, equal 6 plus 6. Hence zero divided by zero equals 12. If we suppose A and B each equal to 4, then we get zero divided by zero equal to 8. Hence again 12 must equal 8; and so, in fine, all finite numbers must equal one another. This has puzzled many a freshman.

The solution is easy enough. The premises are true with a tacit exception, "provided A and B are not equal." In other words, if they are equal, A square minus B square is nothing at all, and we are not reasoning about nothing; for nothing is not a quantity, has no mathematical relations, and cannot be divided by anything, much less by nothing.

This sophism of suppressed conditions in premises is very common in this world, and one aim of that useful, true, yet much maligned science, logic, is to insist that everything material to the argument shall be expressed.

This illustration is purposely simple, being intended to show that more knowledge and more mental development may effectually dispose of a fallacy.

II. For our second illustrations we cannot find a better one than that celebrated jest of the old Greek sophists, which goes by the name of Achilles and the Tortoise. The tortoise has one hundred yards the start of Achilles, but Achilles runs ten times as fast. When Achilles reaches the point where the tortoise was, the tortoise has moved forward ten yards.

When Achilles has reached this point the tortoise has advanced one yard. So, in fine, whenever the "Swift-footed" has reached the point where the tortoise was, the tortoise is no longer there. Hence Achilles will never overtake him.

ARCHBISHOP WHATELY'S VIEW.

Archbishop Whately was a very able man and an acute thinker. In our judgment he held his own in the discussion with John Stuart Mill, and moreover he had the good sense and the good taste not to attempt to belittle his opponent, which cannot be said of Mill.

In Whately's *Logic* over a hundred examples of fallacies are given. This one is No. 86, and is taken from Aldrich's old work. Whately merely substitutes the hour-hand of a clock at any distance, say one foot before the minute-hand, the latter moving twelve times as fast as the former—which is the actual relative speed. We note the following points:

(a) Whately justly criticises Aldrich's solution. "He proposes to remove the difficulty by demonstrating that in a certain given time Achilles would overtake the tortoise, as if anyone had ever doubted that. The very problem proposed is to surmount the difficulty of a seeming demonstration of a thing palpably impossible; to show that it is palpably impossible is no solution of the problem." It certainly is no solution of the problem; yet it is questionable whether the palpable impossibility, referred to, may not do some service by throwing the burden of proof where it manifestly belongs.

(b) "The example before us furnishes a confirmation of the utility of an acquaintance with the syllogistic form; *in which form the pretended demonstration in question cannot possibly be exhibited.*" The italics are Dr. Whateley's. With deference to the opinion of so distinguished a man, we think the italicised clause above given wholly incorrect. The statement must be unwarrantable; and we intend farther on to give the best possible proof of this by quoting a regular syllogism, in Barbara too, which shall exhibit the pretended demonstration in question.

"An attempt to do so," continues Dr. Whatley, "will evince

the utter want of connection between the premises and the conclusion."

We shall see in due time. In his Formal Logic Dr. Morgan states that some valid arguments cannot be presented in a syllogistic form. So too in language, some vigorous idioms refuse to be passed.

SIR ISAAC NEWTON'S VIEW.

We may say of this remarkable man in mathematics, what was said of Oliver Goldsmith in literature, "He touched nothing that he did not adorn."

If the first Lemma of Newton's Principia be true, it settles the whole question, and plays havoc with Dr. Whatley. But if, to borrow an adjective from Edmund Burke, it be not "impious" to call in question a mathematical proposition of that remarkable genius, whose very name we venerate, it must be confessed that the first Lemma of the immortal Principia is inexact, and is not sustained by the mathematical world. This is one of the most extraordinary facts in the history of the science. A loose stone at the base and corner of a pyramid that shall stand when all our words and works shall have been sunk in oblivion! The very first Lemma! The worthy Dr. Davies, the translator of so many French works, and the compiler, and to some extent, the author of so many good text books, maintained that the Lemma was true, and followed it out logically and relentlessly into error.

We should hardly know what to think on this line, if it were not that Newton's Corpuscular Theory of Light has entirely given way to Huyghen's previous Undulatory Theory. So that even Newton could make a mistake.

PRESIDENT BEATTY.

Our old teacher, Dr. Beatty, of Centre College, used to say, "This is a mathematical question; and the fallacy lies in supposing that the sum of an infinite number of terms of a converging series is an infinite quantity."

We formerly regarded this as the solution. For instance, the sum of one plus one-half, plus one-fourth, plus one-eighth, and so on out to an infinite number of terms is usually said to

be two; or, in recent works, two is said to be the limit toward which the sum of any number of terms of the series approaches, but which it can never reach, though it may approach indefinitely near that limit. Thus if a locomotive on a railroad track runs one mile in a minute, it will at the same speed, which is a necessary item in the discussion, run one-half a mile in the next half a minute, one-fourth of a mile in the next fourth of a minute and so on. This argument seems to prove, if it proves anything, that the locomotive never can run more than two miles, if that.

Call this locomotive A, and another one B, on a parallel track, and one mile ahead of A at the start. At the end of the first minute A reaches the point where B was in the beginning. Suppose now that B runs just half as fast as A, B being the tortoise in the race. It will, at the end of that first minute, be one-half a mile ahead of A. At the end of the succeeding half minute B will be one-fourth of a mile ahead, and so on. It would seem to follow that B can never run quite one mile, one being the limit of the sum of the series. As the time and the distance involved go *pari passu*, we are confronted with the astounding result that time itself would come to an end, to the delectation of the Sophists and the horror of all sober-minded men.

COLERIDGE.

Coleridge, it is said, held that this fallacy was insoluble by the intellectual powers of man; but that the introduction of the element of time threw some light on the subject. We think that he was in the right. For, as has been intimated already in the general, if locomotive A should run one mile in one minute, and then half a mile in one minute, then one-fourth of a mile in one minute, it would take forever to run two miles, or a little less than two, if you prefer. As mathematicians say, the series of minutes is not converging.

But if a converging series be employed in time as well as distance, the sum of the terms can not be an infinite quantity, whatever else it may be. So we think that Dr. Beatty's suggestion does throw some light on the case.

Possibly some additional light may be gained by the follow-

ing process: In two minutes' time the locomotive B will run one mile, and the pursuing locomotive, A, will run two miles and overtake B. Now divide either of these distances, say the two miles, into finite parts, into infinitesimal parts, or into parts of both kinds, as we please; then, inverting the old axiom, the sum of the parts must equal the whole. That is, dividing any specific distance or portion of time into parts has no tendency to increase or to diminish the amount of distance or time.

Is this a perfect solution? We fear not. But it may throw some light on this dark subject.

Now why is there so much difficulty in solving this problem? Because it conducts us into the realm of the infinitely small, and the infinite, either great or small, is beyond our reach.

PROFESSOR STEPHEN ALEXANDER.

We once heard this able man lecture in Mercer Hall, Princeton, N. J., and well do we remember his lithe, active figure as he held up the tip of his fore-finger and said, "Produce a straight line through this point in both directions to infinity. The two parts will be equal to each other." Then stepping nimbly over to his left, and holding up a finger tip again, he said, "Repeat the process at this point; again the two parts of the line will be equal. Hence compared with infinity, the intervening space between these two points is nothing."

Could anything be more ingenious, more bewildering, or (*sit venia verbo*) more sophistical? It was worthy of an old Greek Sophist; and it sorely perplexed our youthful mind. The only solution that has ever occurred to us, from that day to this, is that the relations of equal, greater, and less do not subsist between infinitely great quantities. For how do we get our first knowledge of these relations? In part by the sense of touch. Place two yard sticks one on the other, so that an end of the one shall coincide with an end of the other. Of course the other two ends will coincide. But if a yard stick be laid simply on a two-foot rule, the yard stick will project a foot beyond the rule. By some such simpleness we acquire, very early in life, the ideas of equal, greater, and less.

Now lay one infinitely long line on another. They cannot

be laid end upon end, for the obvious reason that neither of them has any end. Then, adopting Professor Alexander's method, let us cut an infinite line into two parts. Each will have one end, and we place the two parts one on the other so that the ends shall coincide. Will the others coincide too? No; for by our supposition they have no other ends. Nor can one piece overlap the other. Hence one of the pieces can neither be equal to the other, nor greater, nor less; while it will extend beyond, and longer than, any finite line.

If there is a flaw in this reasoning, we have never detected it during all these years. Nor do we know whether or not Professor Alexander was in earnest.

The case is not so plain in regard to infinitesimals. Does an infinitely short line have two ends? Very probably it has, one of them being infinitely near the other. Is such a line shorter than any finite line? Manifestly so. May one infinitesimal be smaller than another? The great French mathematicians with one accord affirm that it may; yea, infinitely smaller than that, and so on endlessly. For those brilliant Kelts are fond of saying, as well as doing, startling things.

As to our humble selves we confess that, after many considerations of this subject, darkness still rests upon the face of the abyss. We must learn again the old, not wholly welcome, yet salutary lesson of our human limitations. The infinite perpetually solicits us, yet perpetually transcends or eludes us. We need the infinite. God the Infinite One is our greatest need. With eternity before us we can rest in Him and in Him only. Better be annihilated than be without Him. But do we comprehend Him? Let those who think they do, first grapple successfully with the infinitely small that meets us at every turn in our daily life.

III.

We are thus conducted to the main subject of this article; and our readers may notice that our first illustration prepares the way for the second, and now the second prepares us for the third part of the whole discussion.

We meet with the same kinds of difficulties in the higher themes of Holy Scripture. We say higher not without a mo-

mentary hesitation; for if the contention of the Sophists were well founded, it would upset the solar system, and indeed the entire material universe.

On former occasions we have discussed in our Southern Presbyterian Quarterlies some questions in apologetics. In this present writing we do not intend to take up any individual case for discussion, but to offer some general thoughts which, it is hoped, will be useful to our theological students, young ministers and thoughtful laymen in the churches. Such men ask, and cannot but ask how we are to reconcile the unquestionable existence of so much misery in this world with the precious truth that an Almighty and Most Merciful God lives in Heaven, and that nothing can escape His knowledge; that under the dominion of a Holy and All-powerful ruler this part of His universe to which our knowledge extends it so full of sin; how explain man's freedom and moral responsibility inconsistent with God's foreordination, and His perfectly certain foreknowledge; how justify our responsibility for an act of disobedience on the part of our first parents, which "Brought sin into the world and all our woe." These are some of the knotty questions which many able and godly men have striven to answer. Instead of taking up any one of these, we remark, in line with what we have said above, that we may have a most rational and unshaken conviction of the wisdom and goodness of God notwithstanding the hitherto unanswered objections made by skeptics. We are inclined to regard as reason, or at least a reason why the All-wise God permitted those Sophists to arise and flourish in Athens. For their own amusement they would hatch up difficulties in the way of believing the most undeniable truths, would contend that Achilles, the swift-footed hero of Homer, could never overtake the slow tortoise, or again that all motion was impossible, and the like. Very well. We are much obliged to those acute triflers for teaching mankind that we may be absolutely sure of truths on positive evidence, yet be unable to answer all the objections that may be alleged. So our faith need not be shaken, and we do not need to cherish, or to feel uncomfortable under, misgivings, merely because we cannot

at once rebut any plausible objections to carefully ascertained truth. In very many cases all that we want is a little more knowledge. We have often thought of that passage in the last part of the 7th chapter of John's gospel, "Many of the people therefore, when they heard this saying, said, 'Of a truth this is the prophet. Others said, This is the Christ. But some said, Shall Christ come out of Galilee? Hath not the Scripture said, That Christ cometh of the seed of David, and out of the town of Bethlehem where David was? So there was a division among the people because of him.'"

What a pity that some one in the crowd did not speak up, and inform everybody that Jesus was born in Bethlehem, of the house and lineage of David!

Isaac Taylor, that profound English philosopher, speaks of it as a very interesting state of mind in which a man is placed when the arguments on the opposite sides of a question seem incontrovertible. Sometimes, as in this case from the gospel, the missing link of truth is at once accessible. Christ, or any one of his apostles then present, could have supplied it. Our Saviour announced a very broad principle when He said, He that seeketh findeth. Nicodemus sought and found. How wonderful, too, have been the discoveries of our modern explorers! Think of Egypt, Assyria, Troy. And this is one of the functions of all science, to find, to reconcile, and then to build. Yea, once rejected stones become most precious to us and are built into the walls of the august temple of Truth, and some of them even are made the heads of corners.

It is not superstitious, or fanatical, or unwise to believe that God may by His Spirit be acting in consonance with revelation, convince us so deeply of the truth of Christ's claims that we cannot doubt thereof, as the old organ-builders, guided by the ear, constructed their instruments aright, though in apparent contravention of the laws of harmony, until Helmholtz came and rectified the whole matter. The builders were right all the while. And so are God's saints.

THROW SOME LIGHT.

This phase has occurred several times already, and we now

proceed to see that the same grand principle applies on a large scale to the great unsolved problems of existence. It is believed that this line of thought will be very helpful to the classes] for which we are writing. Very beautiful is the way in which the All-wise One has aided our finite minds. For instance in the whole process of Induction, to which we can only point, but into which our limits forbid us to enter. As germane to our present purpose, we may instance the doctrine of the Incarnation of Christ. If it had been announced, as indeed it may have been, to holy angels before our earth had any sort of inhabitants, say in its molten or chaotic-abysmal, or primordial-granitic state, that the Eternal Creator would one day take matter into a personal union with Himself, there would have been silence in heaven. Nothing less than a sublime faith could have received the statement. Reference is not made to the moral necessities and extraordinary effects involved, which are stupendous. No lesser word, perhaps no other word than that, can so well express the thought. For surely it is one of God's own greatest revealed thoughts.

But the reference is to the union and communion of the Infinite with the Finite, and of Mind with Matter.

When tiny protozoans made their appearance, however, and rudimental intelligence, desire and will were seen in connection with material forms, a ray of light shot into the ancient darkness of the sky overhanging the intellectual abyss. "It is; though we know not how." In the fulness of time man came, in the image of God; and holiness as well as intelligence could in some inscrutable way dwell within a material form. It could for it did. Forty centuries or more of familiarity with this phenomenon on its immense scale of uncounted millions, and withal the special favor granted to certain ones of the holy angels of being temporarily incarnated, prepared the way for the miraculous conception and birth of the Son of God. They threw some light upon the mystery of mysteries. The heavenly choir, aloft above the plains of Bethlehem, believed and rejoiced with great joy.

This, of course, is given as one of many, possible illustrations. The throwing of some light on a dark subject is as old

as the science of Apologetics, as old indeed as all science. Our special points are two: First, large use has been made of this type of argument in other sciences, and even in the science of mathematics. Second, it is susceptible of very advantageous employment in Theology proper, and in Philosophy in general. For instance: The visiting of the iniquities of the fathers upon the children is a matter of present, daily occurrence, as visible as the overtaking of the hour hand of a clock by the minute hand. And it throws light upon the question of our unique relation to Adam and his first sin.

OUR HOPE OF INCREASED KNOWLEDGE IN THE FUTURE.

1. Further knowledge of physical science in its various departments may enable us more fully to understand those subjects of which both nature and revelation treat. For instance the cosmogony of Moses. This has already been to a considerable extent cleared up, and we may hope that every vestige of doubt or hesitation will be removed. Unfulfilled prophecy will come in for its share. As in the case of Christ's first coming, the event interpreted the Scripture; so in the vexed questions concerning His second coming, whether Pre- or Postmillennial, and the first resurrection of the martyrs. An absolutely satisfactory exegesis of the passages bearing on these points can hardly be expected in the 20th century.

The nature of the union of our souls with our bodies, and hence of Christ's soul with His body will, we judge, never be better understood in this world; perhaps never at all. The Irreducible Case in Cubic Equations and the Problem of the Three Bodies, which glowered at the world half a century ago, may be put to rest by genius or by accident before the year 2,000, but not the mystery of our dual being. Yet is it dual only? Have we a body and a soul, and a spirit? Or is this merely a rhetorical amplification? The writer accepts the latter view as, on the whole, the most satisfactory. Dichotomy, we think, accounts for all the phenomena; but who can decide the question?

So with regard to our connection with Adam, Creationism and Traducianism. In what sense did we sin in Adam? Is

Anselm's pronounced Realism true? Has Dr. Landis settled the questions of Original Sin and Imputation? We are afraid not. We wish he had. Or that some original and profound thinker would do so. There must be some relation between us and Adam that, so to speak, compels God to treat us as if we had either in some inscrutable way participated in Adam's first sin, or at least were responsible for its commission. It cannot have been just an arbitrary appointment. No angel could justly have been our federal head. So we think after half a century's puzzling over it we have not solved this question—nor the Irreducible case in Cubics.

O for one hour in heaven at the feet of Paul!

3. In cases wherein the Infinite enters as an element, we can never hope to comprehend what we may, however, apprehend. We can only cast ourselves

"Upon the altar stairs of faith,
That slope through darkness up to God;"

and cry with the three archangels in the Prologue of Faust,

"Fathom Thee none may."

If we cannot climb even to the summits of the Himalayas, how can we hope to ascend to the stars that look calmly down upon us from their inaccessible heights?

WHY ARE SO MANY INCOMPREHENSIBLE MATTERS BROUGHT
FORWARD IN THE SCRIPTURES.

1. The truths exist. We might ask why is God so much greater and wiser than we are? Then as to His works it is probably true that He has planned the best possible universe, that is, the one best fitted to accomplish His purposes; and we must never forget that His thoughts and ways are as high above ours as the heavens are above the earth.

2. Of these thoughts, which should be communicated to man? And who could wisely determine the sundry times and the divers manners, and also the substance of the communications, so well as God Himself? No doubt there was in Old Testament times a certain reticence on the part of the Holy Ghost, a silence gradually yielding to speech, a darkness re-

treating before light; and a large amount of exercise was given to the faith of the Elders who thereby obtained a good report. Nothing is better known than that the progress of science has been remarkably similar to that of Revelation.

3. In New Testament times a new method is pursued. God explains the deep matters of revelation to us not simply so far as it is best for us to know them, but as fully as we can understand them. I had almost said, as fully as he can explain them to human intellects. That is, in many instances. Thus we need to understand the plan of salvation, but that is inexplicable without the doctrine of the Trinity. We may be unable to comprehend the doctrine of the Trinity; but our knowledge must stop somewhere; even our knowledge of ourselves, much more of God. Our belief is that in all the universe, no being, except God, knows himself to the bottom. Certainly man does not. Thus "we are surrounded still with God." Midway His grand temple, from whence, like Anna the prophetess, we go not forth by day or by night, evermore midway, we stand on this Altar-world and worship the everywhere present One. Midway His eternity, evermore midway, we glorify Him, who was, and who is, and who is to come. We give thanks to Him for His great glory, even unto God our exceeding joy.

4. This leads to our last thought. In order that we may be benefited by a truth, it is not necessary for us to comprehend it wholly. We may appreciate the solemn massiveness, silence and antiquity of the pyramid of Cheops, although we cannot encompass its huge bulk with our arms. Or to give an illustration from literature: In Goethe's prologue to Faust, already referred to, Raphael first says of the sun as quiring his rival song among his brother-spheres, after the ancient way, and completing his predestined course with thunder-step.

"The sight of him gives the angels strength,
Though none can fathom him."

Then Gabriel tells of the Earth-Pomp wheeling with inconceivable rapidity from Paradisal brightness into the appalling darkness of night, of the sea dashing upon the rocks, and of

rocks and sea whirling on swiftly in their everlasting sphere-course. Then Michael, of tempests rushing "from sea to land, from land to sea," and of thunderbolts flaming destruction along their routes.

But here, if we understand the great poet, Michael strikes a higher note:

"Yet thy messengers, Lord, worship
The mild on-going of Thy day."

Above the storms and tempests, and in vivid contrast with the uproar of earth and sea, God's Day, that knows no night, goes quietly and gently on; and as Raphael had said that the sight of the Sun and his brother spheres gave strength to the angels, so now, lited up by the song of Michael, the chief archangel, the three rise to a loftier height of praise:

"The sight," ie of God's eternal calm,
"Gives the Angels strength,
While none may fathom Thee."

Only a little of His glory can we ever see; but this will give His children, as well as the Archangels, strength. Only a little; for much would blind, consume, destroy.

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