made to communicate with each other by means of a pipe. The surfaces of the water in these cisterns were made to differ only by a small fraction of an inch ; and it is sup­posed that the motion in the communicating pipe will be the same as in a very long pipe, or an open canal, having this very minute declivity. We have no difficulty in admit­ting the conclusion ; but we have seen it contested, and it is by no means intuitive. We had entertained hopes that this important case would have been determined by direct experiments, which the writer of this article was commissioned to make by the Board for Encouraging Im­provements and Manufactures in Scotland ; but the infirm state of his health was always an effectual bar to the ac­complishment of this desirable object. This however need not occasion any hesitation in the adoption of the Chevalier du Buat’s general proposition, because the experiments which we are now criticising fall in precisely with the gene­ral train of the rest, and show no *general,* deviation which would indicate a fallacy in principle.

We apprehend it to be quite unnecessary to add much to what has been already delivered on the motion of waters in an open canal. Their *general progressive* motion, and consequently the quantity delivered by an aqueduct of any slope and dimension, are sufficiently determined ; and all that is wanted is the tables referred to in the article River, by which any person who understands common arithmetic may compute the quantity of water which will be delivered by the aqueduct, canal, conduit, or pipe. These tables, which with great labour have been computed for this work, here follow.

Table I. *Logarithms of the Values of the Numerator of the Fraction* 307(*√d*-0·1)/*√s*-L*√s+*1·6 *for every Value of the Hydraulic*

*mean Depth* d: *also the Value of* 0∙3 (√*d*—0∙1).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **d.** | **Log. of**  **307 (**√*d*—0∙1**)** | **0∙3**  **×**  **(**√*d*—0∙1**)** | ***d.*** | **Log. of**  **307 (**√*d*—0∙1**)** | **0∙3 × (**√*d*—0∙1**)** | **d.** | **Log. of**  **307(**√*d*—0∙1**)** | **0∙3**  **× (**√*d*—0∙1**)** | **d.** | **Log. of**  **307 (**√*d*—0∙1**)** | **0∙3 × (**√*d*—0∙1**)** |
| **0,I** | **l∙82208** | **0,06** | **4,9** | **2\*81216** | **0,63** | **9,7** | **2'96634** | **0,90** | **54** | **3'34738** | **2,17** |
| **0,2** | **202773** | **0,10** | **5,0** | **2∙81674** | **0,63** | **9,8** | **2'96865** | **0,91** | **55** | **3∙35143** | **2,19** |
| **0,3** | **213815** | **0,13** | **5,1** | **2∙82125** | **0,65** | **9,9** | **2∙97093** | **0,91** | **56** | **5'35539** | **2,21** |
| **0,4** | **2 21343** | **0,16** | **5,2** | **2'82567** | **0,65** | **10** | **2-97319** | **0,92** | **57** | **3∙35928** | **2,23** |
| **0,5** | **2'27040** | **0,18** | **5,3** | **2'83000** | **0,66** | **11** | **2\*99454** | **0,97** | **58** | **3-36312** | **2,25** |
| **0,6** | **2'31618** | **0,20** | **5,4** | **2∙83422** | **0,67** | **12** | **301401** | **1,01** | **59** | **3∙36687** | **2,27** |
| **0,7** | **2'35441** | **0,22** | **5,5** | **2\*83840** | **0,67** | **13** | **3 03189** | **1,05** | **60** | **3-37057** | **2,30** |
| **0,8** | **2'38719** | **0,24** | **5,6** | **2∙84248** | **0,68** | **14** | **3'04843** | **1,09** | **61** | **3∙37421** | **2,31** |
| **0,9** | **2∙4l588** | **0,25** | **5,7** | **2∙84648** | **0,68** | **15** | **306383** | **1,13** | **62** | **3∙37778** | **2,33** |
| **1,0** | **2'44138** | **0,27** | **5,8** | **2'85043** | **0,69** | **16** | **3'07820** | **1,17** | **63** | **3\*38130** | **2,35** |
| **1,1** | **2'46431** | **0,28** | **5,9** | **2\*85431** | **0,69** | **17** | **3'09170** | **1,21** | **64** | **3'38477** | **2,37** |
| **1,2** | **2'48518** | **0,30** | **6,0** | **2'85812** | **0,70** | **18** | **3 10441** | **1,24** | **65** | **3'38817** | **2,39** |
| **1,3** | **2∙50426** | **0,31** | **6,1** | **2'86185** | **0,70** | **19** | **3\*11644** | **1,28** | **66** | **3'39153** | **2.41** |
| **1,4** | **2'52185** | **0,32** | **6,2** | **2∙86554** | **0,71** | **20** | **3∙12783** | **1,31** | **67** | **3∙39483** | **2,42** |
| **1,5** | **2∙53818** | **0,34** | **6,3** | **2'86916** | **0,72** | **21** | **3Ί3867** | **1,34** | **68** | **3-39809** | **2,44** |
| **1,6** | **2'55345** | **0,35** | **6,4** | **287271** | **0,73** | **22** | **3Ί4899** | **1,38** | **69** | **3'40130** | **2,46** |
| **1,7** | **2'56769** | **0,36** | **6,5** | **2'87622** | **0,73** | **23** | **3Ί5885** | **1,41** | **70** | **3'40446** | **2,48** |
| **1,8** | **2∙58ll2** | **0,37** | **6,6** | **2'87966** | **0,74** | **24** | **3'16828** | **1,44** | **71** | **3 40758** | **2,49** |
| **1,9** | **2'59381** | **0,38** | **6,7** | **2'88306** | **0,75** | **25** | **3∙17734** | **1,47** | **72** | **3-41065** | **2,51** |
| **2,0** | **2∙60580** | **0,39** | **6,8** | **2'88641** | **0,75** | **26** | **3∙1860l** | **1,50** | **73** | **3-41369** | **2,53** |
| **2,1** | **2 61713** | **0,40** | **6,9** | **2'88971** | **0,76** | **27** | **3\*19438** | **1,53** | **74** | **3-41667** | **2,55** |
| **2,2** | **2\*62803** | **0,41** | **7,0** | **2'89296** | **0,76** | **28** | **3∙20243** | **1,56** | **75** | **3'41962** | **2,57** |
| **2,3** | **2'63839** | **0,42** | **7,1** | **2'89614** | **0,77** | **29** | **3'21020** | **1,58** | **76** | **3-42253** | **2,58** |
| **2,4** | **2'64827** | **0,44** | **7,2** | **2'89930** | **0,77** | **30** | **3-21770** | **1,61** | **77** | **3'42540** | **2,60** |
| **2,5** | **2∙65772** | **0,45** | **7,3** | **2∙90241** | **0,78** | **31** | **3∙22495** | **1,64** | **78** | **3'42823** | **2,62** |
| **2,6** | **2'66681** | **0,45** | **7,1** | **2\*90549** | **0,78** | **32** | **3'23196** | **1,67** | **79** | **3'43103** | **2,63** |
| **2,7** | **2'67556** | **0,46** | **7,5** | **2'90851** | **0,79** | **33** | **3'23877** | **1,69** | **80** | **3'43380** | **2,65** |
| **2,8** | **2'68395** | **0,47** | **7,6** | **2∙9H50** | **0,79** | **34** | **3'24537** | **1,72** | **81** | **3'43653** | **2,67** |
| **2,9** | **2'69207** | **0,48** | **7,7** | **2'91445** | **0,80** | **35** | **3'25176** | **1,74** | **82** | **3'43923** | **2,69** |
| **3,0** | **2'69989** | **0,49** | **7.8** | **2'91734** | **0,80** | **36** | **3'25799** | **1,77** | **83** | **3∙44l89** | **2,70** |
| **3,1** | **2'70743** | **0,50** | **7,9** | **2'92022** | **0,81** | **37** | **3∙26404** | **1,79** | **84** | **3'44452** | **2,72** |
| **3,2** | **2'71472** | **0,51** | **8,0** | **2∙92305** | **0,82** | **38** | **3-26993** | **1,82** | **85** | **3'44712** | **2,74** |
| **3,3** | **2'72181** | **0,52** | **8,1** | **2∙92584** | **0,82** | **39** | **3-27566** | **1,84** | **86** | **3 44968** | **2.75** |
| **3,4** | **2'72866** | **0,53** | **8.2** | **2-92860** | **0,83** | **40** | **3\*28125** | **1,87** | **87** | **3\*45222** | **2,77** |
| **3,5** | **2 73531** | **0,53** | **8,3** | **293133** | **0,83** | **41** | **3'28669** | **1,89** | **88** | **3∙45473** | **2,78** |
| **3,6** | **2'74178** | **0,54** | **8,4** | **2'93403** | **0,84** | **42** | **3 29201** | **1,91** | **89** | **3 45721** | **2,79** |
| *,⅛l* | **2'74805** | **0,55** | **8,5** | **2∙93670** | **0,84** | **43** | **3 29720** | **1,93** | **90** | **3 45965** | **2,81** |
| **3,8** | **2'7∙5417** | **0,56** | **8,6** | **2∙93933** | **0,85** | **44** | **3 30227** | **1,95** | **91** | **3'46208** | **2,83** |
| **3,9** | **2'76009** | **0,56** | **8,7** | **2\*94192** | **0,85** | **45** | **3'30722** | **1,98** | **92** | **3'46448** | **2,85** |
| **4,0** | **2'76589** | **0,57** | **8,8** | **2∙94449** | **0,86** | **46** | **3'31207** | **2,00** | **93** | **3 46685** | **2,86** |
| **4,1** | **2'77153** | **0,58** | **8,9** | **2'94703** | **0,86** | **47** | **3 31681** | **2,03** | **94** | **3'46920** | **2,88** |
| **4,2** | **2'77704** | **0,59** | **9,0** | **2'94954** | **0,87** | **48** | **3'32145** | **2,05** | **95** | **3'47152** | **2,89** |
| **4,3** | **2'78240** | **0,59** | **9,1** | **2'95202** | **0,87** | **49** | **3∙32599** | **2,07** | **96** | **3'47381** | **2,91** |
| **4,4** | **2'78765** | **0,60** | **9,2** | **2∙95447** | **0,88** | **50** | **3 33043** | **2,09** | **97** | **3∙47608** | **2,93** |
| **4,5** | **2-79277** | **0,60** | **9,3** | **2'95690** | **0,88** | **51** | **3∙33480** | **2,11** | **98** | **3'47833** | **2,94** |
| **4,6** | **2'79779** | **0,61** | **9,4** | **2'95930** | **0,89** | **52** | **3∙33908** | **2,13** | **99** | **3'48056** | **2,95** |
| **4,7** | **2-80269** | **0,62** | **9,5** | **2'96167** | **0,89** | **53** | **3'34327** | **2,15** | **100** | **3∙48277 2,97** | |
| **4,8** | **2'80747** | **0,63** | **9,6** | **2'96402** | **0,90** |