

Correspondence.

The Pole and Chimney Problem.

To the Editor of the SCIENTIFIC AMERICAN :

In the answer to query No. 7293, January 8, is not the length of pole there given the shortest that will touch the hearth and both front and back of the chimney? As the question is printed, the answer would be dependent on the size of the house, as a pole in a position nearly horizontal would be indefinitely long. No mention is made of any particular height up the chimney as being required. It is stated — for maximum $l \frac{d}{\alpha} = 0$; but it has not been shown whether this is a maximum or a minimum, as the value of $\frac{d^2}{\alpha^2}$ has not been determined. If my calculation is correct, it works out a minimum, the result being $\frac{d^2}{\alpha^2} > 0$.

H. S. BURROUGHS.

[Certainly; and it is also true that the shortest straight piece which will touch these three points is the length of the longest pole which will pass these points and go up the chimney.

We fail to understand the question as our correspondent does. By the longest pole, etc., we understand that the pole is to be put into the chimney vertically. When it has entered the chimney it can then be raised to any height desired. The size of the house and the distance it shall go up the chimney after it is in the chimney are not in the question in any way so far as we can see.

The length of pole given is correct for the diagram at the head of the demonstration.

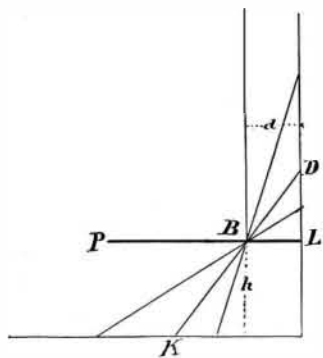
In justice to Prof. Filkins, it should be stated that he showed in his solution that the line A C was a minimum line, as well as the maximum length of pole for the purposes; but as the question only asked for maximum pole, that point was omitted from the answer. Anyone interested can prove this by trigonometry by solving the right triangle with an angle at the base $15^\circ 15'$ and $15^\circ 17'$. The length A C will be found to be greater in both cases.

The question has no practical value, since anyone who wanted such a pole could soon find with two sticks how long to cut the pole. The practical solution is, to the practical man, just as satisfactory as the mathematical solution is to the mathematician.—ED.]

To the Editor of the SCIENTIFIC AMERICAN :

In your issue of January 8, page 29, one of your readers asks: What is the longest pole that can be run up a chimney, the height of the mantel being 48 inches and the depth, from front to back, 16 inches?

The solution given leads to a correct answer, but in a roundabout way, and further is misleading as pretending to find a maximum. It really finds a minimum, and this is the reason why: The formula that is differentiated expresses the length of a straight line passing through B (see adjoining figure) and limited by



the floor and by the wall. Such a line, if horizontal or if vertical, is infinitely long, and if neither horizontal nor vertical it is finite, and, in a certain one of its intermediate positions, as DK, it is a minimum; that is, it is shorter than in any other position. Now, supposing the pole PL started in the horizontal position and turned upward into the chimney by keeping it in contact with B and its end L against the wall. It is clear that it will never be able to pass through the intermediate position DK unless it be at least as short as DK.

This minimum value l is given by the rather elegant formula

$$l^3 = h^3 + d^3$$

whence $l = (h^3 + d^3)^{\frac{1}{3}}$. In the problem as given, $h = 48$, $d = 16$.

The cube root of h squared is $\sqrt[3]{48 \times 48} = 13.2$

The cube root of d squared is $\sqrt[3]{16 \times 16} = 6.3$

The sum is 19.5

and the square root of the cube of the sum 19.5 is 86.5 the length required.

JOSEPH BECKER,

Assistant Examiner Patent Office.

Washington, D. C., January 12, 1898.

[This note does not add anything to our knowledge of the problem for putting a pole up the chimney. It is not clear to a lay mind why the writer should say such

a horizontal line is infinitely long. We should suppose the longest horizontal pole which would enter the chimney would be 18 inches long. The chimney is not infinitely deep. Similarly the longest pole to enter vertically is 48 inches long, since the mantel is not an infinite distance above the floor. It is quite necessary to observe the usual arrangement of a chimney and fireplace in discussing this problem, else one is liable to wander from the question. We close this discussion with a note from Prof. Filkins, who prepared the original solution of the problem.—ED.]

To the Editor of the SCIENTIFIC AMERICAN :

The solution of the "chimney problem" given in your issue of January 8, p. 29, by the writer has been extensively criticised, owing to the omission of certain lengthy and unnecessary mathematical amplifications.

The question as asked was, "What is the longest pole that can be run up the chimney" under certain conditions? In choosing notation, the writer preferred that which would simplify the result and shorten the solution, provided persons unversed in the higher mathematics wished to use it.

One communication on the solution makes a criticism covering that part which the writer performed, but did not think necessary to send you. The same communication contains a result, $l^3 = h^3 + d^3$, which has been styled a "rather elegant formula" and which is evidently considered superior to the other. In reality it is based on the writer's result and may be obtained from it by an extended algebraic and trigonometric process, which the communication fails to give.

CLAUDE W. LE. FILKINS.

Adelphi College, Brooklyn, N. Y., January 19, 1898.

The Temperature of Arid Regions.

Mr. Willis L. Moore, Chief of the United States Weather Bureau, and therefore an accepted authority on matters pertaining to climate, expressed the opinion, in a recent paper on "Some Climatic Features of the Arid Region," that the ideal climate as regards equality of temperature and absence of moisture does not exist in the United States. Such a climate, he says, is found only on the plateaus of the tropics, as, for example, at Santa Fe de Bogota, in Colombia, where the average annual temperature is about 59 degrees. The southeastern part of the United States has the nearest approach to this ideal temperature. Even in the southwest the range of variation is too great, and the rainfall reaches from nothing to a point greater than is to be found in the Eastern or Middle States. The study of meteorological conditions is most interesting, the flavor of speculation that is about it rendering it charmingly attractive. Experts tell us that ranges of temperature depend upon the dryness of the air and the clearness of the sky. Thus, while the summer temperature of the Southwest is high, the real degree of heat as felt by animal life is not indicated by the common thermometer, but by a mercurial thermometer, the bulb of which is wet at the time of the observation. In this manner is shown the temperature of evaporation, the sensible temperature, and, more nearly than can otherwise be indicated, the actual heat of the body.

The inland valleys and plains east of the Rocky Mountain foothills have an average summer temperature of from 65 degrees on the north to 80 degrees on the Gulf coast. While the daytime heat in the arid regions seems excessive, it is not really so, owing to the extreme dryness of the atmosphere. It is, as is well known, the moist, "sticky" heat that is prostrating. Again, in these regions the radiation at night is so great that the temperature is made tolerable, and, indeed, comfortable. Estimated by the temperature of evaporation, the arid region is the coolest part of the country. The falling of temperature from the time of the greatest heat is irregular and not at all dependent upon longitude reckoned west from Greenwich. Mr. Moore cites as an example of this the fact that the temperature falls as much by 6 P. M. in Denver as it does by 8 P. M. in New York and Philadelphia. This is accounted for in the greater daily range and more rapid rate of cooling at elevated stations.

Soap Applied to the Ocean.

The North German Lloyd steamship "Gera," which recently arrived in New York from Bremen, ran into a tempest in midocean on January 7, and shipped the crests of many combers. Her commander decided to try the efficiency of soft soap and oil on the waters. It is, of course, usual for storin-tossed vessels to use oil in the quieting of troubled waters, but the combination of soft soap and oil is rare. It was run from the closet pipes on the weather side, about sixty feet abaft of the beam. About eight gallons of soft soap and four gallons of thick lubricating oil were used. The soft soap was dropped through one pipe and the oil through another nearby. A heavy lather appeared on the sea and the crests ceased breaking aboard. The storm moderated next day and the "Gera" was able to make her usual winter weather speed the rest of the trip.

Recent Archæological News.

At Palestrina, two more fragments of the Prænentine stone calendar of M. Verrius Flaccus have been discovered. They give the observances for August 1, and mention a previously unknown sacrifice to Victoria Virgo on the Palatine Hill.

Michelangelo's poems have just been published by Prof. Frey, of Berlin, the first complete and authentic edition ever issued. He had access to the family archives, which had been almost entirely closed to scholars.

The Italian government has resolved to found at Florence at public expense a library of all the books which have incurred the censure of the Sacred Congregation of the Index. The Vatican has protested against the measure, on the ground that the majority of the books in question are improper to the last degree, and that the establishment of a collection of such a nature is an affront rather against public morality than against the discipline of the church.

William Tell has dwindled into a myth. Rousseau's tomb, which has been the bourne of so many pilgrimages during the last hundred years, has now been discovered to be untenanted, and now Bonivard, the "Prisoner of Chillon," so beautifully sung of by Lord Byron, is shown to be something very much akin to a fraud. Visitors to the old Castle of Chillon, on the Lake of Geneva, have long gazed with reverent eyes on the track worn in the stone pavement around the pillar to which the captive was chained during his long incarceration. This year the famous footprints mysteriously disappeared. An inquiry was made in the Cantonal Legislature as to what had become of them. Thereupon M. Vecqurat, Councilor of State, rose and unblushingly explained that they had never existed at all, but were artificially manufactured to satisfy the demands of a sentimental public. This year the usual repairs were done so late that there was no time to renew this venerable sham.

For more than 1,800 years, says The New York Times, the city of Mainz, or Mayence, as most people who do not live there call it, has been a walled and fortified place, with most considerations of convenience and commerce subordinated to those of war. At last, however, it has been decided that perhaps the residents of the town will be in no great danger if the ancient bulwarks are taken down. Anyhow, the experiment is to be tried, and as soon as the value of the land on which the walls stand can be settled the work of demolition is to begin. This land, of course, is government property, and the official assessors think that it is worth \$1,000,000. The citizens regard the price as high, but they will doubtless pay the sum demanded, since the rigid cordon is a terrible nuisance to them and a constant obstacle to the expansion of the city. The military authorities of Germany are said to view the matter with indifference, as opinions respecting the strategical value of fortified towns has changed much since the siege of Paris. The present tendency is to attach no importance to fortresses not directly on a frontier, and not even Emperor William thinks of building stone fences around his capital.

The Rome correspondent of The Times writes: An important decision regarding the export duties laid on such articles of commerce as fall under the very vague and elastic heading of "antiquities" has just been rendered by the Court of Appeals in Rome. As is known to all who have attempted to purchase such articles there, the export duty of 20 per cent levied on them by a law which is an inheritance from the Papal government is not only a grave charge, but one which it is sometimes embarrassing to determine, the value of such things being purely fantastic. The law, known as the Pacca edict, applies only to the late Papal territory, each one of the ancient realms of Italy having still its ancient regulation, the duty from Tuscan being one per cent and that from the former Austrian possessions nil. The Roman court has decided that it only applies to such objects as are recognized as "precious," i. e., as of exceptional artistic or historical value. The limitation is as vague as the old definition, and perhaps the best results of the decision will be to compel the government to pass a general and rational law, under which the possessor of an object having value from its antiquity shall be free to carry it out of Italy. Prof. Villari, when Minister of Public Instruction, proposed a sensible and comprehensive law, which, while imposing a small duty and the necessity of a permission to export, for the purpose of controlling the exportation of the heirlooms of the nation, made it indispensable for the government either to purchase or permit the exportation. This law, like most of those which the public good has called for, has ever since lain covered by the petty legislation for electoral purposes, which impedes all useful reforms other than those demanded by the constituents of the ministerial deputies. If an object is precious and indispensable to the honor or history of Italy, it is reasonable that its exportation should be prevented, but only by purchase, for it is an outrage that a man may not dispose according to his interest or necessities of articles which are his unquestionable property.