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VOL. XII
ANSWER TO
REMONSTRANCE

LETTER TO THE COUNCIL FROM
W. J. ROBERTS. ROBERTS.
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Tus Curosicle published last Satur-
thy the fuil text of the remonstrance day the full text of the remonstrance
that hat been addressed to the commou that has been addressed to the commou
conacil ngainst the sewer syatem which conacin maninst has under consideration
the conacil the
Below will be found the answer to the objections of the remonstrants that ha
been turnushed the council at their re been furnshed the councilat their re quest by Civil Engineer Roberts, who
planned the eystem and made the estimater of cost. After the nddress and
forma! Introduction Mr. Roberte pays : Theneed of a eewerage system for The
Daile I have bever heard questioned From a manitary etandpoint the clty i
unclean. Cespools in use for forty years are full to overflowing. The ground is ditated with house-drainage. Con
ditions are favorable to develop zymoti dieaser. You can not violate the laws
of eantation, I may almost say of deseney, withont punishment. It the value and some other states fix it thus) one preventable death in three years would pay the cout of the whole aystem and contribute something to the einking fund in addition. Typhoid fever, acariet fever,
diptheria, yellow fever, cholera, and othere, are classed as preventabie did-
eases. How preventable, do you auk? eases, Hou preventable, do you auk
By cleanlinesy. Remove oflending matter from the soil, and the air vou
breathe will be pares, No question arone over the dieposal of the sewerage. Nothing seemed more
natural than to diecharge the natural than to discharge the sewerage
into the Columbia dippertion it would be rendered hirmlezs, The location of the maine and brancess af planned has invited mach criticiem. Assuming that a map of the aystem lies before you, permit me to call attention
to the went; that in the sewerage of any patweet, either in alley or atreet, to s cross atreet : that the alley wae adopted for the following reasons:
First.-1t is a shorter diatance form the fixtures to be dramed to the alley than to the middle of the atreet in front.
Second.- Interruption Second,-Interruption to traffic by
conetruction and repairs in atreat would conetruction and repairs in atreet wound Third.-The average depth would be
greater in सtreets that have been filled greater in streets that have been filled to grade than in alleys.
All three pont
ailey linees ponte conspire to make the
lines expensive than parallel As to having one priacipal intercept
ing sewer running weat ingtead of serer smalier ones running north, permit twe to quote from my report to you dated
May 11, 1899, as follows: "It may be trged by some that the lines flowing to-
Warde the river,
, warda the river, such as the Liberty
street line, the Union, Laughlin and Monroe street lines should be continued
actose throngh the railrond and discharged
separate lines iuto "China Slough" or the river. Such dieposeal
of the eewerage would be diengreat tay the eeast, to inhabitante of premises
north of exceed the proposed, and the cost would order to drain the twelve lote in the aver-
age block by and age block by a eingle branch the eewer

- muat be carried through the alley. The trenchiag and back-filling is 57 per cent
of the coat of the larger pipe of the aewer, so that the Second atreet can be laid in the same
trench an the crease of coot than sewer at leas innorthward 200 feet or more aeroes the
railroad track As an illuatralion teach separate line." north of Siscond und Langhtin. That the block between Union and Court can be beet eewered by a line in the alley flowing weotward In ass Union atreet towardo Mill Creek, In preferance to northward on Union
aitreet acroes the nell exident. The weaterly oourse is more
difect.


## EVERYBODY

Knows the merits of the

## $\left.\begin{array}{l}\text { COLUMBIA } \\ \text { HARTFORD } \\ \text { PATEE CREST }\end{array}\right\}$ i]IVIGEC

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noticeably less. Also the crossing of a tions of Frderal and Washington differ ing and timbering at a large expense
inatural elope of the ground is weetward ing and timbering at a large expenee
which can be avoided by going under elope of the ground is weet ward
Federal atreet being two feet higher tha the O. R. \& N. Co's track through the a point in the alley thirty feet east o
treatle on the bank of Mill Creek.
Washington, though in Waehingto trestle on the bank of Mill Creek.
Take next the block between Court $\begin{aligned} & \text { Washington, though in Waehingto } \\ & \text { street an artifial fill has raised th }\end{aligned}$ and Washington, north of Second. grade six inches above Federal. Wit Having laid the lateral through the alley the sewer constructed through the alley
from Waehington to Court, would you to Washington will it not be cheaper to after going 30 or 40 feet into Court
atreet turn north on Court 500 feet to
west of Wet the sewer westward to the lin
ent the river, or continue westward 30 or across the railroad to "China Slough" 40 feet to the line already built weat $\mid$ The amane reasoning applies to the of Court street? It is true the sewer weat of Court would have to be increased
in size to admit the additional sewerage In iize to admit the additional sewerag
from one block, but this increase in diameter of piperequires noextra trench ing for sizes under fifteen inches in dia-
meter of pipe, and the difference in price per foot of the pipe of average diamete the system and one increased enough to admit the sewerage from one book
amounts to one third cent per foot o $* 3.33$ for each 1000 feet. Apply this in outlet, if you pleaze, and it only amount to $\$ 4.00$. Doees any one think the sewer
for the block mentioned can be built worthward on Court atreet, across the
railroad to river for $\$ 400$ or even fifty railroad to river
times that euv?
Take the third
of Second, between Federal and Washing ton. At this point opinions will be expressed that the lateral sewer through the alley should flow eastward and then
turn northward on Federal to the river, turn northward on Federal to the river,
or continue east to Laughlin street and or continue east o Laughing street and
then north to the river. This comes from the fact that Waehington atreet is the backbone of the eity. It is notice aly higher than cross-atreets east or weat of it eapecially at fourth and third streete, -lees marked at second street,
and the ridge dieappeare altogether on and the ridge
Main etreet.

## Examine the profle of the alley be- ween Main and Second and the eleva-

 block north of Second street betweeFederal and Laughin, -lor althoug Federal is 2.5 feet higher than Laughlin on alley line this difference extends only
fifty feet east of Federal where the difference diss ppeare altogether and the fall in 300 feet horizontal, or 1 in 300 , is called, for one block ench of 15 inc and 12 -inch pipes. A 12 -ineh pipe lai
on a grade of 1 in 450 has a velocity of feet per second. The same pipe with grade of 1 in 300 flowing half fuli has velocity of 2.46 feet per second. A 15 .ine pipe under same condition has a velocit of 3.57 feet per second, and the velocity
for either is increased 12 per cent when for either is increased 12 per cent when
flowing eight tenthe full. These are all "eelf clennsing velocitiee". No grade in the system is flatter than $i$ in 300 . The effective operation of the ezwera with flow may be made as easily westward as
eastward, and if weetward then acrose eastward, and if weetward then acros rederal to unite with the th
of sewer already mentioned. It now remaing to thew.
It now remains to show that the pro
poeed intercepting sewer through thi posed intercepting sewer through thi
alley north of Second street has sufficien fall or slope to give the velocity required to make the sewer self-cleansing. Promi nent engineers agree that the velocitie should be greater than two feet per
second $\ln$ sewers 10 to 18 inchea diameter second in sewers 10 to 18 inches diamete
euch as this. The flattest grade pro posed on the. line or any hine is is one pro
these gradients is a certain as the law these gradients is as certain as the law
of gravity.
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