Mr. R. L. Parshall,
Senior Irrigation Engineer,
Fort Collins,
Colorado.

Dear Mr. Parshall:

Replying to your request for a list of the Parshall Type of the larger flumes now in use in this state, will say that our compilation is not complete but substantially so. This compilation discloses the following:

<table>
<thead>
<tr>
<th>Flumes with a throat width of</th>
<th>256</th>
</tr>
</thead>
<tbody>
<tr>
<td>from 1 to 5 ft.</td>
<td></td>
</tr>
<tr>
<td>6 to 10&quot;</td>
<td>27</td>
</tr>
<tr>
<td>11 to 15 ft.</td>
<td>8</td>
</tr>
<tr>
<td>16 to 20&quot;</td>
<td>3</td>
</tr>
<tr>
<td>21 to 30&quot;</td>
<td>2</td>
</tr>
<tr>
<td>30 to 40&quot;</td>
<td>1</td>
</tr>
</tbody>
</table>

Making a total of ———— 297, or say, 300 flumes.

This compilation does not include a number of installations in Irrigation Division No. 5, at Glenwood Springs, nor in Irrigation Division No. 3, comprising the Rio Grande Basin, but practically all of such installations would be of the smaller size flume.
Mr. R. L. Parshall---#2

I have no compilation of check measurements on any of these flumes, other than those made by Owens, Snyder and yourself, all of which you probably have.

Very truly yours,

M. L. Neiderhiser
State Engineer.

MCH/T
Dear Mr. Marshall:

I hoped that you would part from the Bulletin on the larger plunges until fall, for then we will have a much more definite and conclusive set of data. In considering the enclosed data I wish you to make some allowance for the following:

In general it seems that an all of my measurements made after June 1st seem to be running under perhaps my meter wasn’t in the best condition. The Hb gages on the Holbrooke Res. still plunge were obtained by merely measuring down to the water surface from the top of the still well — rather concerning! The Ames ty was completely submerged or so nearly so that one could scarcely see any difference in reading, however if you will plot them you will find that they closely follow the curve for 95% submergence, with the
exception of #1 made when there was still mud on the floor of the structure — this measurement was made to satisfy Syp.

I have no excuse to offer on the Nin-Mil 6 foot — should have made more measurements in 1930 but couldn’t get to it.

You kept the notes on the Ft. Ryan measurement so probably have this data.

There have been no measurements made on the flume at Brinidal as yet — it is possible that I can get one trial night after the fight — that is again in my territory.

I am to complete the irrigated land claimed started by Brungar. Have to complete the south side of River from Las Animas down. This will be a little relief from routine stuff.

Better come down and enjoy some of this fine weather.

Ralph.
Mr. Ralph Parshall  
Fort Collins, Colo.  

Dear Mr. Parshall,

I am sending you herewith the copy of the original meter notes as taken in checking the venturi flume on the Bijou Canal. The gage heights were checked oftm and the gage height given is the mean of all the observations taken.

<table>
<thead>
<tr>
<th>$H_a$</th>
<th>$H_b$</th>
<th>Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.53</td>
<td>2.33</td>
<td>290 s.f.</td>
</tr>
</tbody>
</table>

The discharge from the drum for a gage height of 2.53 I take to be 337 s.f. and the submergence I calculated to be 92% which gives a correction of 47.0 s.f. (approx.) then the discharge I get to be, the 337 minus the 47.0 or 290 s.f.

Within the current meter I get the discharge to be 289 s.f.

If there are any mistakes in my deductions on the venturi flume I shall be very grateful to you if you will put me right on the thing.

Very truly yours,

[Signature]

97

80
Dear Mr. Parshall:

Rocky Ford Canal, 4-15-31

<table>
<thead>
<tr>
<th>H₂</th>
<th>H₆</th>
<th>Sub.</th>
<th>Computed</th>
<th>Measured</th>
<th>Deviation, % Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.357</td>
<td>1.227</td>
<td>91</td>
<td>68.7</td>
<td>68.3</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Pipe to H₂ well seemed clean.
Results probably good. If time I shall spend a few minutes to check corn in head. Against your diagram.

Burgess & I measured catlin and #1.

2.481 = 174.96, 70% submerged.
Burgess was going to check computation & drop you a card.

Ralph.
Mr. R.L. Parshall
Senior Irrigation Engineer
Fort Collins, Colo.

Dear Mr. Parshall:

I shouldn't have been surprised to have seen you down here any time during the last two weeks, since it will be still three weeks before you can get down here, I want to ask you about two matters.

The other day I measured the Holbrook ditch with Cressy's help. We found that the soundings did not agree with the gage height at all, this of course may have been due wholly or in part to submergence (80%) but I rather think that the floats in the Ha well have been damaged by a counter weight falling on them. A seam on the small float has opened and some of the oil has no doubt run out. The large float has been dented so that it rides in the water at quite an angle. I suspect that both of these floats will have to be replaced. We made a hook gage reading, but the measured discharge will not check with it at all (that may again be due to submergence). You have some figures (apparently elevations) written on the table beside the standards for the tape gages. I took these to apply to the top of the base of the standards. Adding the hook gage reading to the observed gage height should give the elevation you have written on the table, and did so in the case of the Ha gage but did not in the case of the Hb gage.

<table>
<thead>
<tr>
<th>Observed G.H.</th>
<th>Hook gage</th>
<th>Rating table disch.</th>
<th>Current meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ha 2.07 Hb 1.80</td>
<td>2.24</td>
<td>246</td>
<td>279</td>
</tr>
</tbody>
</table>

I wish you would tell me about the floats, where to get new, how much oil etc. I would also like a copy of the curves for correcting for submerged flow, also one of the latest discharge curves.

The Fort Lyon automatic is giving trouble. The nut that holds the cylinder snug on the shaft loosens up and the cylinder fails to turn with the shaft. I suspect we will have to put a lock nut on it. I think that this gage is or has excellent possibilities, but I would like to suggest a couple of changes. Instead of the sprockets and chains use a wooden pulley with the double groove such as the Bristol now uses. Instead of the 24 hour clock with train of gears use one that makes one revolution a week such as the Bristol.

There are only a few of the charts left for the Holbrook gage, but I understand that you are going to change that gage anyway.

Yours very truly,

[Signature]

Ralph Owens
Holly 11-14-29

Dear Mr. Parshall:

I am returning the data on the Holbrook, also sending that I have on the Ft. Lyon.

My measurement of 2.495 ft. was made Mar 8/29. I am dubious about the G H of 2.24 made with the hook gage, Curley and I must have slipped off some place. The tape G H at this time was 2.07 (H A). The H A tape G H checked very closely with the hook. But there is a difference of .017' on the H A. While I haven’t taken time to compute the G at 2.07 I rather think that it will be pretty far off in the other direction. I believe you would be justified in discarding this measurement.

The Ft. Lyon data is not
very complete, because when the submergence was low I didn't record H₂O readings.

Practically all ditches are now dry, although the Ft Lyon and Holbrook are both running water — the Holbrook has about 125 ft. with approximately 75 ft. submergence. C. Eddy tells me that he can increase to 250 ft. for a day if we wish to take a set of measurements. If you can't get away I will spend a day on it. Whatever is done, however, will have to be done pronto.

I have run into a peculiar thing on the Ft Lyon. The chart house has a tendency to creep up on the cylinder so that the recorded C.H.₃ are about 0.10' short. I have reset the charts several times and find that in from 24 to 48 hours it has slipped up again. I have been wondering if we could fasten a strip on the cylinder similar
to those & you had on the old instrument for this flute; or perhaps a couple of fixed points would do the business. However I shall await your thought on this.

I have had no word from Hindenburg in respect to my working with the Vintani to assume that he intends me to play in "My own back yard." Is that about correct?

If you see the Professor you may tell him that I have been playing with the concrete back I have picked up the work where we left off and am going ahead, though I find it goes very slowly.

Yours very truly

Ralph Owen

P.S. Drop me a line about the Halbrook & I will catch several measurements on it.
Holbrook 20' Venturi

<table>
<thead>
<tr>
<th>H₂</th>
<th>Q</th>
<th>% Submergence</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.24</td>
<td>249.51</td>
<td>75</td>
</tr>
<tr>
<td>1.71</td>
<td>178.00</td>
<td>73</td>
</tr>
<tr>
<td>1.55</td>
<td>119.10</td>
<td>97</td>
</tr>
<tr>
<td>1.74</td>
<td>174.12</td>
<td>96</td>
</tr>
<tr>
<td>2.36</td>
<td>280.65</td>
<td>90</td>
</tr>
</tbody>
</table>

Subject: 10-15-29.

Lyf is haulin' for a meeting on the H. Bent so I will apprise him of it if you will send me the formula for the 14' flume. As I remember it it was 54:54.7 H₂ 1.614. If I had the 10' 15' I would attempt interpolating for them.

I am busy with charts today. Yesterday at 11 AM I went to the Ft Lyon to see the new instrument and found it OK.

Ralph Owens
SUBJECT:
910 Lincoln Ave.
La Junta, Colo.
July 8, 1929

Dear Mr. Parshall:

This has surely been a long dry spell.

I have surely been disappointed because I have not had the opportunity to get high measurements on the Ft. Lyon and the Ft. Bent. I did obtain one good measurement on the Ft. Lyon at the 761 a.f. decree, and two others on fluctuating stages the accuracy of which are not very dependable. Amatly thinks that they are all right if the depths are properly adjusted to correspond with the gage heights existing in the various sections at the time of getting the velocities, but it is my opinion that a scheme is poor on the Venturi, due to the piling up of water on the sides on the converging section.

On June 20 the Ha=2.77 Hb=0.95 Q=751.84 (good) 34%

On June 24 Ha=4.21 Q=1464.05 (0.6 method)

On June 29 Ha=3.43 Hb=2.00 Q=1054.05 (0.2, 0.8, 58%)

using 4 foot sections.

The Venturi in the Nine Mile Ditch seems to be a second Ft. Bent, the velocities on the bottom are greater and the flume seems to run a little short.

The Highland flume was very well constructed, though the sides of the converging sections are not the same length, and the inlet to the still well is a hole not exactly placed. I have no level now but using the gage as Gaylor set it I checked very closely so thought I would leave well enough alone.

I have had a time with the Hyde, they are just now ready to install the flume, but there is a row about whether the ditch is charged for the water they get from the Vista Del Rio or not. I wrote the Boss asking him to lay down the law, so that now I think they will be ready to do it properly.

The Lamar Canal, since it has been cleaned out, has secured until my last rating was issued from a straight line. I will have to give them a complete rating this week. I think we will insist on a Venturi in this ditch this fall.

We have always had storms when you come down, so I think you had better do this way Pronto. We need the rain.

[Signature]

Ralph Owens
My dear Marshall,

Your letter of the 3rd received and was very glad to find out how to get a large holding for a given quantity of water in the Holtwood Canal. We made another measurement of flow with Page HA 184.46.87 and discharge of 174 ft³ which fell in with your formula. Mr. Dunn made a recent measurement on the SE Lyons HA 2.86 H6 130 discharge 774.09 which fills the valve, the submersible on the SE Lyons Series considerable.

I was there this morning and the Page was HA 277 H6 156 only 40 ft. I receive from the chart I took off, at one bin HA 277 H6 156 12 hours later HA 277 H6 120 and 12 hours later HA 286 H6 156 of course caused by sand shifting. I imagine that after our high water about July 1st, we will find considerable more submersible than we will for the first three weeks of high water. The automatic on Holtwood seems to be working fine and have had no trouble with it. I stopped once for some canvas, the one on SE Lyons in all night if he had a cut which at end of drum, that comes up some. We have only two new charts for the SE Lyons Automatic. Can you send more down, or where can Mr. Anshley get them. I will try and keep you posted. Our River is very slow and they have been putting dry. Mr. James, yours truly.

Yours truly,

[Signature]
La Janta
1-31-29

Dear Mr. Parshall:

Ft. Lyon 40' Venturi.

<table>
<thead>
<tr>
<th>AV Ht. G.H.</th>
<th>Q</th>
<th>July 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.91</td>
<td>829.58</td>
<td></td>
</tr>
<tr>
<td>3.08</td>
<td>916.50</td>
<td>25-907.3</td>
</tr>
<tr>
<td>3.49</td>
<td>1107.14</td>
<td>29-1108.2</td>
</tr>
</tbody>
</table>

These page heights are the average of 6 taken while sounding plus 12 taken while obtaining velocities divided by 5.

In last measurement the stage fell 0.15", but I didn't make any correction for it other than average in the 4 H's that we use.

Ralph O.
Mr. R. L. Parshall
Experiment Station
Fort Collins Colo.

Dear Mr. Parshall,

I made a current meter measurement on the new Parshall flume in the Colorado Canal on June 27, which I think may be of interest to you.

The Ha gage begining was 2.29
" " ending " 2.28

The Hb gage Begining was 1.60
" " Ending " 1.54

The discharge by current meter was 426.39 sec. ft.
The ditch had been cut about 70 sec. ft. about 2 hours before measurement was taken which accounts for the drop in gage ht. I did not wait quite long enough for it to entirely settle or else the river was dropping slightly at this time.

Method of measurement: two and eight tenths.

Very truly yours,

[Signature]
Consolidated — — 2-18-31  0.35  4.90

Fl. Lyon. — 2.1 3-24-31 1.784 366.73

Amity — — 4-7-31 

Lamar — 6.5 4-6-31 1.482 111.76

Not very many and not very helpful.

The Amity is running about as last fall.

For the Lamar, Canal float was checked and measurement made with all the care in the world. I wonder if you could have made an error in obtaining the crest, elevations? Before I made this gaging, I went over the floor with a fine toothed comb and numbered some dozen ticks.

The channel just above the flume seemed to be a trifle higher than the flume floor itself. I have found in one other place that neither raised the 8.

Ralph.