6 cwts. would best suit the character of the stuff of most of the Otago reefs, though for such, consisting principally of hard, more or less solid quartz—as, for instance, Logan's Reef, the Canada Reef, &c. —stamps up to 8 cwts. would, no doubt, be preferable.

Touching the height of drop and speed of the stamps, the former should not be less than seven inches, and might advantageously be increased to nine inches, especially if the stamps are light; whilst touching the speed, it is generally considered best at the rate of 75 to 80 blows per minute. On the amount of stuff crushed during a certain time I could not obtain any definite information, but the figures given seemed to me to be rather low, and in order, therefore, to show what ought to be done under certain conditions, I may mention that at the Port Phillip Company, Clunes, stamps of 6 cwts., driven at a speed of 75 blows per minute, and with a drop of eight to nine inches, crush in the average 2 tons 4 cwts. per 24 hours; whilst others of 8 cwts., with the same fall and speed just given, are expected to reduce each up to 5 tons per diem. Regarding the iron coffers, they seemed to me rather, if not too shallow for both economic and effective working. They allowed hardly one inch of loose quartz to be put beneath the false bed-plates, and it would, therefore, require the greatest care in the placing of these plates, the feeding, &c., to prevent the plates from working unevenly into the shallow gravel bed. In fact, I think it can hardly be avoided that they (the plates) come frequently in contact with the iron bottom, the result of which, of course, is, as the sound of the blows already indicates, ineffective working and great wear and tear—sometimes even an unexpected breaking of the coffers. On this account I think it would certainly be advisable to have the latter, say, about two inches deeper, so as to allow a gravel bed of three inches beneath the false bottoms. Considering that the office of these latter is not only the saving of the coffers from wear and tear, but mainly to prevent the gold from being smashed too fine, or "beaten dead," as it is called, they should be only of the same size as the stamp-heads, in order to leave sufficient space around them for the liberated gold particles to get into the gravel out of reach of the stampers.

The provision of self-feeding hoppers—a great desideratum for saving labour—has been neglected at a great number of the machines, and would deserve early attention. Many practical quartz crushers consider, and no doubt rightly, that hand feeding, if properly executed, is more effective; still it is extremely doubtful whether, especially in the case of small machines, the value of the increase in the quantity of stuff crushed is equal to that of a man's labour; in my opinion, this labour is far more profitably applied to attending upon the gold-saving appliances. With only one or two exceptions, I found the great defect of the coffers having only front discharge; for it must stand to reason that, as it is, or ought to be, the aim to get the finely crushed material quickly out of the boxes, large escapes both in front and at the back are the most effective. Of course, such a double-discharge arrangement necessitates a corresponding increase in the quantity of water to be supplied per stamp-head: a supply of from five to eight gallons per head per minute, regulated according to the weight of the heads and the nature of the crushing stuff, would, however, satisfy all requirements. The gauge of the gratings, varying at the different machines from 122 to 144 holes per square inch, is, I think, scarcely well adapted to the nature of the stuff treated; for, as the gold is mostly very fine, the gratings should be very fine also, in order to insure the necessary degree of reduction for a satisfactory liberation of the gold particles. Gratings with 169 to 196 holes per square inch would certainly be safer.

Gold Saving Appliances.—As regards the gold saving appliances in use, they consist, with the exception of two machines, which have deep drop-ripples attached, of amalgamated copperplate tables, in some instances with improvements in the arrangement of the ripples, and all, except the cement crushing machines, have various length of blanket-strakes succeeding. During working, it is the regular custom to put quicksilver into the stamper boxes. For the treatment of the blanket sand, serve the common revolving barrel with shaking table or ties attached, dolly tubs, small Berdan machines and simple ties, though the latter inferior appliances at a few machines only. Although generally well constructed and carefully attended to, as I found these appliances at the machines at work, and as they respectively are, and were said to be at those at a standstill, most of the managers I came in contact with were well aware that they lost a considerable percentage of the gold, and in some instances notable quantities of quicksilver besides. Considering this general loss, which in some establishments was occasionally much increased through an insufficient supply of, and the use of muddy water, I attribute it mainly to three causes, viz., the use of amalgamated copper plates, too strong an inclination and insufficient length of the blanket strakes, and last, though not least, to the introduction of mercury into the stamper boxes. It would lead too far here to enter into a discussion upon the merits or otherwise of copperplate tables generally; suffice it to say that tables of the same pattern as those under notice were, at one time, in high favour in Victoria, but careful trials soon proved their inefficiency in many respects, and they have at all the principal crushing establishments been long ago discarded in favour of more perfect appliances, which I shall mention further on. According to Küstel and other authorities on the subject, they have also suffered a similar fate long since in California—the country where they were first introduced. The putting of quicksilver into the boxes is no doubt a great improvement in case of copperplates being used, but it is fundamentally detrimental in the crushing of stuff so highly charged with pyrites as most of the Otago reefs produce. For it is a well-known fact that pyrites generally, though certain kinds more than others (and these abound in the latter reefs), cause a flouring of the mercury and amalgam in the boxes, and for the saving of such floured stuff no method has yet been discovered. On this account I would therefore strongly advise to abandon the practice, even in case of copperplates being retained; for the loss both in quicksilver and gold caused by it alone is, perhaps, much larger than what would be sustained by less efficient working of the plates through its disuse. I may at this place take the opportunity to remark, that I hold the practice of special harm with regard to the cement crushing machines at Blue Spur, on account of the abundant occurrence in the bottom portions of that cement of secondary pyrites, *i.e.*, such formed in the drift, a kind that through easy decomposition is very prone strongly to flour the mercury. Considering also that the generality of the gold crushed from the cement is dirty, *i.e.*, more or less coated with oxyde of iron, or pyrites, and that therefore the copperplate tables (which I found only in use) have but a poor chance of retaining it, I think the attachment of blanket-strakes, or perhaps better of a well-constructed tail-race, would be found very profitable. Touching the blanket-strakes, they are, at most