by salt. The more destructive evil of musty vats or casks, so often a cause of the nauseous flavour of the common wines above mentioned, is remedied by scraping, by wash­ing with boiling water, and most effectually by firing or charring the insides ; while staves which are deeply injured are replaced by new ones. Hot lime and water are also used for the same purposes.

Another precaution is that of removing all the insoluble matter, of whatever nature, during every stage of the pro­cess ; and from this neglect it is also that the great mass of bad wines is produced in those countries where this art is neglected. Thus the seeds are always to be removed as fast as they rise to the surface, as they both render the wine harsh and communicate a bad flavour. The same is done with the husks when they have performed their duty in giving out their colour. It is most peculiarly necessary to be watchful over these, lest they should become mould­ed or musty ; whence often arises that taste which re­sembles that of what is called *corked* wine ; a disease also arising from a bad cask, and often attributed wrongfully to careless bottling. In the finer wines, a single musty seed or husk will ruin a whole tun. In transferring the wine from the vat to the cask, or from one cask to another, whether by drawing ofl' or pumping, care must be taken not to disturb the sediment, and more especially still, to separate any of the scum which may be on the surface, as this is always in danger of becoming musty, more particu­larly where it is most injurious, that is, in the lighter and finer wines.

When the quantity of the fermented fluid is considerable, the remaining wine, which adheres to the solid matter, is separated by the press, and made into wine of an inferior quality, either for use or distillation. That refuse is also subjected to distillation with water in some cases ; some­times, by means of water, it is converted into vinegar, or used for the manufacture of white-lead or of verdegris ; or, lastly, formed into cakes with the other refuse of the first pressing of the grapes, and used for feeding cattle.

If, after the wine is made and tunned, it were suffered to go on fermenting, it would in many cases be destroyed. This, it has already been seen, does not easily happen in the sweet wines, where a large portion of the saccharine matter remains unchanged, though even these are not ab­solutely exempt. Nor does it very easily happen in the stronger dry wines. Yet it does happen to all, and is al­most inevitable in the light still wines, and in the brisk ones, whatever the strength or sweetness of the latter may be. Champagne would quickly become vapid, Burgundy would become stale and sour, and Claret would become vi­negar. For though the natural progress is supposed to be from the vinous to the acetous stage of fermentation, there are phenomena in practice which show us that we are yet imperfectly acquainted with the exact nature and varieties of fermentation. Champagne, for example, becomes mu­cilaginous and flat ; while, though Burgundy becomes acid, it is scarcely possible to make it pass to the exact state of vinegar.

Yet the tendency to the acetous stage must be considered as general, for want of a better expression ; and on this view the management after the great fermentation is regulated. If it is suspected that even intended sweet wine has been over­wrought, boiled must or sugar is addcd to it, and thus, in the tedious fermentation of the cask, it is secured or restored. But it must be remarked, that if the acetous stage should have commenced, that addition would only serve to accele­rate and determine it. The remainder of the general ma­nagement consists in regulating the fermentation of the cask by the general principles before laid down ; that is, if the wine is incomplete, it is not suffered to rise to the bung-hole, so that the new leaven which is disengaged may fall back again and protract the fermentation, while this is also

aided by heat, by stirring up the lees, and by agitation. If the reverse be the case, and it is necessary to check the secondary fermentation, then a cool temperature and rest are adopted ; while, as fast as the wine wastes, it is kept close to the bung by fresh additions, that so the disengaged leaven may escape. Some of the other requisites to the completion of wine will fall better into another section of this little essay; but the process of sulphuring belongs to the second stage of management, as well as to the final ope­rations of the manufacture.

However vulgar and mechanical the process of sulphur­ing may appear, it is a refined chemical operation, the prac­tice of which was long known before the theory, however discovered, and the theory of which, in a scientific and rigid view, is not very well understood even now. It has been already shewn, that the process of fermentation has a per­petual tendency to continue as long as all the requisites are present, and more particularly as long as there is present that peculiar and obscure substance, the extractive matter or leaven, on which it mainly depends. If this substance has been entirely separated in the two forms of yeast and lee, the process terminates naturally, the produce being dry or sweet, according to other circumstances now under­stood ; but if any portion of leaven remains in the liquor, then the acetous or some similar stage may come on, and the wine will be destroyed.

The processes of racking and mechanical separation just described, are all intended to separate this matter ; and whenever the wine remains turbid, it is always in danger, because the fermentation may at any time be renewed. But these operations are often insufficient to disengage all the leaven or lee, as much of it not only continues mixed, so as to produce the turbid state, but the extractive matter itself, which has not been brought to this insoluble form, remains combined with the fluid.

The merely turbid state is remedied by the process called fining, which precipitates all the insoluble or disengaged lee and leaven that will neither subside nor rise ; thus re­moving one part of the hazard, besides communicating that brightness and beauty which is demanded in all wines. That brightness, therefore, is more than a beauty, since without it there is no security, at least in the finer and lighter wines. Various substances are used for this purpose, and the action of many of them is very obscure. They are either chemi­cal or mechanical. The mechanical substances are sand and gypsum, both of which have the property of precipitat­ing the insoluble matter, while the latter also absorbs water. Beechwood chips are sometimes used for the same purpose ; but the mode in which these act is not known. But the matters chiefly in use are chemical ones, gluten and albu­men. Of the latter, eggs and milk are both used, but the former are preferred. Of gluten, isinglass alone is used ; for, from some causes hitherto undiscovered, the gluten of terrestrial animals, or common glue, does not produce this effect to the same extent that it is obtained by the glue of fishes. It is also usual to adopt albumen for the white wines, and gluten for the red, as the former is found to precipitate much of the colour from these last. The proportion used is very small, an ounce of isinglass being sufficient for a hundred gallons. To these chemical matters we might have added starch, gum, rice, and blood ; but they are very little used. The action of the albumen appears more me­chanical than chemical ; becoming coagulated, and then entangling the dust, if it may so be called, which is sus­pended in the fluid, in the same manner as it would purify muddy water. In the case of the gluten, however, a new chemical combination is formed with the tannin of the wine; and the produce is that well-known substance resembling bird-lime, which is the basis of leather. Hence, also, fining diminishes the astringency of red wines.

Presuming that one of these substances has been intro-