they should be painted as if in the background. When your painting is finished leave it to dry for some days, then size it with two coats of patent size (allow the first coat to dry before applying the second) and varnish with white spirit varnish. The sizing is put on from top to bottom, and every part gone over, and the varnish must be laid on in the same manner. White wood can be stained black thus: Boil logwood for twenty minutes in enough water to cover the chips, lay it on to the wood while hot, and while it is still wet apply a coating of pyrolignite of iron. When dry, repeat this process, and when again dry, put on another coating of pyrolignite of iron. Sandpaper your surface with a fine paper until it is perfectly smooth; dust away the sand and varnish, mixing lampblack with the varnish if you want a dull black surface. If you do not wish to varnish your wood but wax polish it, lay wax and turpentine upon it, and leave for twenty-four hours, then rub the surface smooth with pieces of cork.

CERTAIN PROPERTIES OF OIL PAINTS.

(Extracts from an Article by the celebrated French chemist, M. Chevreul

Painting is done with two objects in view—either to change the natural colour of the surfaces of various articles, or to protect those articles by rendering their surfaces less easily altered by air, rain, dust, &c. Three conditions must be fulfilled:—

1. The paint must possess sufficient fluidity to spread with a brush, and also be viscous enough to adhere to the surface without running, and to leave coats of equal thickness when the surfaces are inclined or even vertical.

2. The applied paint become hard.

3. After hardening it must adhere firmly to the surface on which it has been applied.

I have proved that the hardening of white lead or zinc-white paints is due to the absorption of the oxygen of the atmospheric air. And since pure oil hardens we see that the hardening is the effect of a primary cause which is independent of the drier, white lead, or zinc-white. Besides, my experiments demonstrate that white lead and oxide of zinc manifest a drying property in many cases, and that this property exists also in certain substances which are painted—lead, for instance. The painter, therefore, who is desirous of knowing, at least approximately, the length of time necessary for his work to become dry will have to consider all the causes which produce that effect. Consequently a *drier* will not be considered as the *only cause* of the drying phenomenon, since this phenomenon is assisted by several substances having also the property of drying under certain circumstances. Moreover, there is this remarkable fact, that the *resultante* or sum of the activities (drying powers) of each of the substances entering into the composition of the paint cannot be reckoned by the sum of the activities of each substance. Thus, pure linseed oil, the drying power of which is represented by 1·985, and oil treated by manganese, with an activity of 4·719, will, when mixed, possess an activity of 30·828. If there are substances which increase the drying properties of pure linseed oil there are others which act in an opposite direction. For instance, if one coat of linseed oil is applied upon glass it will dry after seventeen days; but if the same oil is mixed with oxide of antimony it will take twenty-six days to dry. In this case the oxide of antimony acts as an anti-dryer. Linseed oil, mixed with oxide of antimony and applied upon a cloth painted with white lead, will dry after fourteen days; the same oil, mixed with the arseniate of protoxide of tin and applied upon the same cloth, will not harden for six days. Oak appears to possess an anti-drying property to a high degree, since, in the experiment of 22nd December, 1849, three coats of oil took 159 days to dry. In the experiment of 10th May, 1850, a first coat of linseed oil was dry only on the surface ofter thirty-two days. Poplar seems to be less anti-drying than oak, and Norway fir less than poplar. In the experiment of 10th May, 1850, three coats of linseed oil took twenty-seven days to dry for poplar, and twenty-three days for Norway fir. If there be a drying activity and a contrary one in certain substances, I have no doubt that there are also circumstances under which linseed oil is not influenced by the nature of the surface on which it has been spread. For instance, in the experiments of 10th May, 1850, one coat of linseed oil was given upon surfaces of copper, brass, zinc, iron, porcelain, and glass, and in every case the oil was dry after forty-eight hours. I hasten to say that I do not pretend to classify all the substances, when in contact with linseed oil, or any other drying oil, into drying, anti-drying, and neutral, because the circumstances under which these substances are placed may cause variations in their properties. I believe that a substance may be drying or anti-drying under different circumstances—whether it be due to the temperature or the presence or absence of another substance, &c. For instance, metallic lead is drying towards pure linseed oil, whereas white lead, which is well known to possess drying properties, is anti-drying towards linseed oil applied upon metallic lead. If painters desire to understand their operations well, they must consider the drying of their painting in the same manner as I have just pointed out. By so doing, and in certain determined cases differing one from the other, they will be enabled to modify and improve their ordinary methods. Linseed oil is naturally drying, and this property increases almost always by its admisture with white lead, and in certain cases with oxide of zinc. If the mixture be not sufficiently drying, recourse is to be had to an addition of oil boiled with litharge or manganese. At the same time it is necessary to consider the nature of the surfaces painted over—whether it be a first, second, or third coat, the temperature of the air, the light, &c. From our present point of view, drying oil, boiled with litharge or manganese, loses part of its importance, because it may be dispensed with for the second and third coats, and even for the first one if the natural drying is added by the temperature. Moreover, pigments themselves may act as substitutes, as in the case of light colours, which are altered by yellows or browns, if the painter has derived profit from some of the observations indicated in this article. Thus linseed oil, exposed to the air and to light, becomes drylng, and loses its colour; it may therefore be employed with white lead or zinc-white without impairing the whiteness of either. Since by associating oxide of zinc with carbonate of zinc it is possible to dispense with a drier, we have a new way of avoiding the inconvenience of coloured driers; at the same time it gives a hope that new combinations of colourless substances will be found, presenting greater advantages than those just noted. My experiments demonstrate that the processes generally followed by colour manufacturers for rendering oils drying—that is, by heating them with metallic oxides—are open to objections of waste of fuel and colouration of the product. Indeed, I have shown—(1) that oil kept at a temperature of 70° C. for eight hours had its drying powers considerably increased; (2) that if peroxide of manganese be added to the oil kept at this temperature it becomes sufficiently drying for use; (3) that a very drying oil will be obtained by heating linseed oil, for three hours only, with 15 per cent of metallic oxide, and at the temperature generally adopted by the colour merchants. My experiments explain perfectly well the effect of linseed oil, or, more generally speaking, of drying oil, in painting. Indeed, when oleic acid is mixed with metallic oxide it passes instantaneously from the liquid to the solid state, and there is no uniformity in the *ensemble* of the molecules of the oleate. The effect is different when a drying oil, absorbing oxygen, passes progressively to the solid state. The slowness with which the change takes place allows of the symmetrical arrangement of the oily molecules, which would appear transparent if there were not opaque molecules between them. But if the latter do not predominate the arrangement is such that the painting is glittering, and even brilliant, because the light is reflected by the dry oil as by a looking-glass.

MR. RICHARD PROCTOR, the eminent English astronomer, in a recent lecture spoke briefly of a new theory regarding the pyramids. He stated that some time since he endeavored to place himself in the position of those making astronomical observations without the assistance of telescopes, with the object of studying their requirements and the best methods possible with the means at their command. The result was a structure very similar to the pyramids, which he believes were obviously built originally for astronomical purposes. He exhibited a section of one of the great pyramids, and called particular attention to two galleries ascending toward the north and the south, which must have served the purpose now fulfilled by the transit instrument indicating the exact moment when the leading stars were in the meridian.

PAPER HANGING.—To prepare the walls, make a size of glue and water, then give the walls a coat of a very weak solution of the same. To make a paste, take two pounds of fine flour, put in a pail; add cold water, and stir it up together in a thick paste. Take a piece of alum about the size of a small chestnut, pound it fine and throw it into the paste; mix well. Then provide about six quarts of boiling water and mix while hot with the paste until the whole is brought to a proper consistency. This makes an excellent paste and fit for use when cold.

MOTHS.—A little spirits of turpentine added to water with which floors are washed will prevent the ravages of moths.