

there was but one opinion, that it would sweep every other dye out of the vat-house. Not only was its application so simple, requiring solvents instead of mordants, but at the price, and especially at the price then current for all dyes, it was the cheapest, with given results. A cosmopolitan demand at once set in, therefore, for anilines, a demand which not only enhanced figures to famine prices, but which was far beyond the possibility of supply. That supply depended on coal tar; coal tar depended upon gas works; gas works, after all, are of limited number all over the world—*ergo*, the aniline supply could be but limited. As madder fell into a state of almost desuetude, prices naturally depreciated, until from an average of twelve cents a pound, it is not now worth two cents. Thus, as aniline became scarce, madder became cheap, and manufacturers were enabled to pit their “Turkey Reds” in the shape of Pompadour prints and their like, at prices the very best informed anilinites, or anybody else, never dreamt of. And this brings us to the issue.

We cannot now see, whatever we foresaw in bygone days, that madder and its derivatives, have anything at all to fear from aniline and its beautiful eliminates. As circumstances alter cases, so the position of the two chief dyes are equalized by the extent of the supply and the restrictions of demand. Aniline can not be produced *ad libitum*, madder can. Almost unlimited high prices will always be given for the former; but the latter, experience shows us for the first time, can be grown for almost unlimited low prices. The rich and the poor consumers can thus be well served; but madders go with the poor and therefore the popular prices of both may, nay they will, fluctuate as markets may dictate; but the fear that aniline will end in the supersession of madder is, we think, entirely groundless. The madder “day” is imminent, if not actual now-a-days, and wherever we go its “hues” are more prominent than those of its great competitors.

THE influence of magnetisation on the tenacity of iron has been lately studied by Signor Piazzoli. Iron wires were hung between two hooks and ruptured by pouring water into a vessel suspended from them. They were about 350 mm. long, and were inclosed in a spiral with four windings one over another, which were either all traversed by a current in one direction, or two by a current in one direction, and two by an equal opposite current, so that in both cases the wires were equally strongly heated by the spiral; but in one case they were magnetised, in the other not. The weights required to break wires annealed in charcoal—weight of one metre,  $G = 0.299$ —were, during magnetisation,  $P = 1260.1306$ ; without magnetisation,  $P' = 1213.1270$ . In the case of wires annealed in carbonic oxide—where  $G = 0.46$  g.— $P = 1732.4.1742.7$ ;  $P' = 1703.62.1719.87$ . In the case of wires annealed in hydrogen  $P = 1289.5.1310.1$ ;  $P' = 1263.1299.7$ . In each separate series accordingly the difference,  $P - P'$  was frequently less than the difference between the highest and lowest weights required for rupture of apparently identical wires; still, the mean values in each of the fourteen series were from about 1 to 3 per cent greater for the magnetised than for the unmagnetised wires, showing that the tenacity of iron increases on magnetisation.

## DEGENERATION.

BY ALFRED R. WALLACE.

Degeneration causes an organism to become more simple in structure, in adaptation to less varied and less complex conditions of life. “Any new set of conditions occurring to an animal which render its food and safety very easily attained, seem to lead as a rule to degeneration; just as an active healthy man degenerates when he becomes suddenly possessed of a fortune; or as Rome degenerated when possessed of the riches of the ancient world. The habit of the parasitism clearly acts upon animal organisation in this way. Let the parasitic life once be secured, and away go legs, jaws, eyes and ears; the active and highly-gifted crab, insect, or annellid may become a mere sac, absorbing nourishment and laying eggs.”

We see incipient cases of degeneration in the loss of limbs of the serpentiform lizards and the pisciform mammals; the loss of eyes in the inhabitants of caverns and in some earth-burrowers; the loss of wings in the Apterix and of toes in the horse; and, still more curious, the loss of the power of feeding themselves in some slave-holding ants. More pronounced cases are those of the barnacles—degenerated crustacea, and the mites—degenerate spiders; while we reach the climax of the process in Ascidians—degenerate vertebrates, and such mere living sacs as the parasitic Sacculina and Lernæocera, which are degenerated crustaceans. Not only such lesser groups as the above, but whole orders may be the result of degeneration. Such are the headless bivalve mollusca known as Lamellibranchs, which are believed to have degenerated from the head-bearing active cuttle-fish type; while the Polyzoa or Moss-polyps stand in the same relation to the higher Mollusca as do the Ascidiens to the higher Vertebrates.

While discarding the hypothesis that all savages are the descendants of more civilized races, Prof. Lankester yet admits the application of his principle to explain the condition of some of the most barbarous races—“such as the Fuegians, the Bushmen, and even the Australians. They exhibit evidence of being descended from ancestors more cultivated than themselves.” He even applies it to the higher races in intellectual matters, and asks: “Does the reason of the average man of civilized Europe stand out clearly as an evidence of progress when compared with that of the men of bygone ages? Are all the inventions and figments of human superstition and folly, the self-inflicted torturing of mind, the reiterated substitution of wrong for right, and of falsehood for truth, which disfigure our modern civilization—are these evidence of progress? In such respects we have at least reason to fear that we may be degenerate. It is possible for us—just as the Ascidian throws away its tail and its eyes and sinks into a quiescent state of inferiority—to reject the good gift of reason with which every child is born, and to degenerate into a contented life of material enjoyment accompanied by ignorance and superstition.”

This is very suggestive; but we may, I think, draw a yet higher and deeper teaching from the phenomena of degeneration. We seem to learn from it the absolute necessity of labor and effort, of struggle and difficulty, of discomfort and pain, as the condition of all progress, whether physical or mental, and that the lower the organism the more need there is of these ever-present stimuli, not only to effect progress, but to avoid retrogression. And if so, does not this afford us the nearest attainable solution of the great problem of the origin of evil? What we call evil is the *essential* condition of progress in the lower stages of the development of conscious organisms, and will only cease when the mind has become so thoroughly healthy, so well balanced, and so highly organized, that the happiness derived from mental activity, moral harmony, and the social affections, will itself be a sufficient stimulus to higher progress and to the attainment of a more perfect life.

For numerous instructive details connected with degenerated animals we refer our readers to the work itself—truly a small book on a great subject, and one which discusses matters of the deepest interest, alike to the naturalist and the philosopher.—*Nature*.