the author's own work in his professional practice, and in carefully conducted experiments.

A somewhat novel feature of the book, and one which will commend it to the manufacturer and mill-owner, is the closing chapter on 'The finance of lost work.' The lost work, the cost of the lubricant, the quantity used, and the saving or loss of energy effected by the change of one lubricant for a better or a poorer, are represented by symbols, and embodied in equations, by which general principles, as well as special results, are reached. The application of these equations is illustrated by the solution of several problems.

While the author points out the need of more extended experiments in some directions, and warns the reader against drawing conclusions too hastily from insufficient data, it would seem that the method outlined, and so extensively pursued, covers the whole ground of investigation required for the complete solution of all questions relating to losses due to friction in mechanism.

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## *DARWIN'S BIOGRAPHY.*

SOME men are great, and some men famous: a few are both, and among them Darwin is pre-eminent. Greatness is a quality, fame a circumstance, which greatness, unhelped by fortune, cannot secure. In this century, there have been many great intellects celebrated to the votaries of science for their achievements, yet not famous with the public. Darwin is not solitarily pre-eminent: of his own generation we may count a number his compeers. He stands high aloft, yet he is even overtopped in sheer greatness by his greatest contemporaries; but, among them all, not one equals Darwin in deserved fame. The influential importance of a discovery is measured neither by the ability of the discoverer, nor by the magnitude of the difficulties overcome. There have been other intellectual efforts as successful and grand in their making and results, as that which established the Darwinian theory, but, in our time, no other of equally profound far-reaching and lasting significance to mankind.

In studying Darwin we have to bear in mind to separate the greatness of the man from the fame of his influence. The time has not yet come to fully estimate the man — we must await the biography promised by the family; but we are already able to appreciate the directness and force of his intellect, his noble candor, his courage under suffering, and, above all, his insatiable love of knowledge and research; we can appreciate also the revolution of belief he caused.

If a poet were to imagine forth a career, which without adventurous incident, or participation in the great affairs of nations, should stir the world, he might, if a great artist, conceive a character at once simple and noble; endowed with irrepressible love of knowledge; given over to study; indefatigable in gathering facts, and always marshalling them into logical phalanxes, making the front and flanks of his evidence alike impregnable: he would place this character aside from the bustle of the world, and perhaps add ill health to the conditions to enforce closer retirement, and accentuate the obscurity of secluded labor; and the poet-artist would endow his created man with means, that his life might be altogether devoted to study, without pecuniary harassments to impede the absolute concentration of mental effort. Last of all, the poet's conception includes a great idea. For year after year the toil would continue, unheeded but prosperous, until the long-growing thought becomes a proven generalization — the whilom mystery of nature is clarified. At last the result is given to the world; it turns the minds of men topsy-turvy; all civilized nations are convulsed with the turmoil of discussion, angry and turbulent: the suddenly famous philosopher maintains his retirement; he withholds himself from all share in the profitless fury he has aroused; he does not swerve from the continuation of his unobtrusive labors, but repeatedly re-enforces by more facts and more logic his published generalization. In a few years the vituperation, which was hurled at him in unmeasurable quantity, ceases; yet a little while, and his due is paid — fully: the world, that had but just now reviled him, turns about and acknowledges the mighty progress the one man has accomplished for all. Now the work is finished: the rich recompense of universal gratitude has been earned and received. Then the life closes, honored by every class and in every country. At his death it is already known that this student's name will henceforth mark the century in which he lived, because the kings, generals, and politicians of his time are all less than the unpretentious investigator.

Our supposed poet, the maker of this his-

*Charles Darwin und sein verhältniss zu Deutschland.* Von Dr. ERNST KRAUSE. Mit zahlreichen bisher ungedruckten briefen Darwins, zwei portraits, handschriftprobe, u.s.w., m. lichtdruck. Leipzig, *Günther*, 1885. 8+236 p. 8°.

tory, would have given us one of the noblest creations of genius, — one full of inspiration to every master and drudge of science. But the poet is too late: the career he should invent has been lived in reality by Darwin. Can any one contemplate it, and not feel that it is beautiful?

The biography of Darwin is a theme worthy of genius: it should be written with eloquence, as well as with insight and discrimination. But Darwin's life possesses so much inherent interest, that any conscientious narrative of it must be meritorious. Dr. Krause furnishes us with a biography the preliminary character of which is frankly confessed. It is not in any sense the great work we hope for, nevertheless it deserves genuine praise. The author gives a vivid and loving sketch of Darwin's career, and adds enough of the personal history to convey a clear impression of his character, which was so pure and open, that its noble traits impressed not only his friends, but also all who knew him. Indeed, there are many who feel that the man was finer than any of his works. Dr. Krause, as was natural for the editor of the German evolutionary magazine, *Kosmos*, has made his book more than a personal history by including an account of the rise and triumph of the Darwinian theory. All this is so well done, that the book affords a very clear idea of the inception of the theory, and of the leading episodes of the prolonged warfare which was initiated by the publication of the 'Origin of species.' It is certainly a very interesting history, plainly but well told. Moreover the volume, albeit not large, contains a sufficient outline of all Darwin's chief investigations. The principal excellence of the work, however, lies in the correlations it establishes between Darwin's labors and both the circumstances of his life and his personal traits. In short, we commend the book as the best available source of a general knowledge of Darwin. The volume gains in interest by a couple of fairly good portraits — a view of Darwin's home at Down, a *facsimile* of an autograph letter — and the publication of a not inconsiderable number of letters from Darwin to various German naturalists. It is well printed in clear Roman type, not in Gothic abominations. It may be noted, that it is to be followed by a companion volume of translations into German of such of Darwin's smaller writings as have not previously appeared in that language. We hope that this biography will be soon published in English translation.

We have endeavored to express the twofold nature of the interest Darwin excites. Dr. Krause portrays his greatness, but his fame must be explained more fully hereafter by some profound philosopher who knows thoroughly and understandingly the intellectual history of the nineteenth century.

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## *EDIBLE AND POISONOUS FUNGI.*

ALTHOUGH the larger fungi, popularly called toadstools and mushrooms, are not so dangerous as is generally believed, it is certainly a difficult matter for the public to distinguish between the forms which are edible, and those which are injurious, or even fatal. The two charts, with twelve colored plates by Prang, are intended to aid those who are not botanical experts, in recognizing some of our more common edible and poisonous species. With each plate is a brief description of the species figured, and directions for cooking; and, under the heading of 'general directions,' Mr. Julius A. Palmer gives a short account of the distinctions between poisonous and edible fungi. The plates are, in general, well executed and characteristic; and some of the best edible species, as Coprinus comatus, would be recognized, without hesitation, by the most inexperienced. The plate showing puffballs is not well done from a botanical point of view; and, with regard to the plates in which several different species are shown in one group, it may be said that the effect is confusing; especially in the plate of Russulae, where, after the directions for cooking, the warning is added, "the noxious members of this family resemble the esculent so closely, that, to the amateur, tasting each one as gathered is the only guide; the hurtful ones being always hot and acrid." In such a case, one would suppose that plates would be of little use to the general public. In continuations of this work, it is to be hoped that the crowding of several species on one plate will be abandoned.

If Americans do not make use of fungi to the same extent as some other nations, it is, perhaps, quite as much owing to their ignorance of the way to cook them, as fear of mistaking the edible and noxious forms. Numbers of our common species are delicious when well cooked: but on the other hand, as usually prepared for the table, they are quite the reverse; and, until the number of good cooks is much greater than it is now, we can hardly expect fungi to become a very popular

*Mushrooms of America, edible and poisonous.* By JULIUS A. PALMER, jun. Boston, *Prang*, 1885.