ANYTHING from the pen of Alfred Russell Wallace, the co-formulator with Darwin of the doctrine of the survival of the fittest and the greatest living writer on natural history, is entitled to our respectful attention, be the subject what it may. In *The Wonderful Century. Its Successes and its Failures*, Mr. Wallace has chosen a field in which his ripe
years and long memory, his power of lucid
disquisition and his skill as a dialectician
have abundant room for display. He
spreads before our eyes the gains of the
present century in the arts and sciences,
and contrasts them favorably with the
discoveries and generalizations of all pre­
ceding ages of the world.

Leaving aside fire, which all mankind
seems to have known from the remotest
ages, and which is by far the greatest of
human discoveries, the author finds only
five inventions of the first class in the
centuries preceding our own, namely, the
telescope, the printing press, the marin­
er's compass, Arabic numerals and alpha­
abetical writing, and to these he adds, with
some hesitation, the steam engine and the
barometer, reminding us that Watts's en­
gines were used almost entirely for pump­
ing before the year 1800. Of theoretical
discoveries before the present century he
mentions the foundation of modern chem­
istry, the foundation of electrical science,
the theory of gravitation, Kepler's laws,
the differential calculus, Harvey's proof
of the circulation of the blood and the
determination of the velocity of light by
Jupiter's satellites. We may point out
here that writing and printing have been
the means of preserving for mankind the
vast accumulated capital of discovery and
speculation, together with the earnings
acquired from using it by each succeeding
generation, thus forming a sort of uni­
versal bank where all may draw and none
may waste, where the interest returned by
a single mind in a century may more than
make up for the apparently fruitless toil
of millions of other minds. The Arabic
system of numerals, with its decimal no­
tation, has given the world a universal
standard of value, so that quantities of
things of the same kind can be counted
and their relation to other quantities seen
by men of different tongues and races
with certainty and without mental effort.

Of the discoveries of the present cen­
tury, Mr. Wallace places railways first and
steamships second, as they happen to be
in point of development and as they un­
doubtedly are in the importance of their
effect upon the destinies of the human
family. A great military critic has forci­
bly pointed out the similarity of condi­
tions which applied alike to Alexander
the Great and Napoleon, by reminding us
that between Arbela and Waterloo the
limitation in time of human action was
the speed at which a horse could gallop.
If the electric telegraph had not been in­
vented we should now have railway trains
running at a speed of at least 150 miles
an hour to subserve commercial needs.
As it is, mechanical transportation has
more profoundly altered the conditions of
human existence than all other discov­
eries put together. Only seventy years ago
the growth of London was limited to the
number of mouths which could be fed by
the fields of Kent, Essex and other sur­
rounding counties within horse-and-cart
radius; to-day, London eats fresh mutton
from New Zealand and bread from the
Dakotas. That this change is due directly
to the substitution of mechanical traction
for horse-haulage is proved by the fact that,
in New York city to-day, the cost of haul­
ing a ton of coal one mile by horses is ap­
proximately fifty cents under the most
favorable conditions, while the same ton is
profitably hauled one mile on the railway
for half a cent, or one-hundredth of the
cost of horse traction. Nearly all the colos­
sal fortunes of the present have been due,
either directly or indirectly, to mechani­
cal transportation, whether by an increase
in the value of city property, by the
bringing of outlying sources of raw ma­
terial within the radius of manufacturing
centres, by the quick and frequent turn­
over of capital invested in the wholesale
collection and distribution of commodi­
ties, by the direct profits of transportation
or by the gambling in securities based upon one or other of these forms of tangible wealth. Nor are the political and social changes less remarkable, though these are probably as yet only in their infancy. The concentration of the multitude in cities has given it vast powers of political action and an audible voice, has endowed it with fierce aspirations for some of the comforts and ease of exhibited wealth, and has allowed the passion of envy its first opportunity to turn the minds of whole communities from honest toil to the legislative pillage of the earnings of their more fortunate neighbors.

We must pass rapidly over the remaining subjects given as successes by Mr. Wallace, merely pointing out the chapter on dust, which is now believed to give us our moderate rains, our brilliant sunsets and our diffused daylight, as equal in fascinating lucidity of statement to anything ever written by Tyndall on kindred topics, and assuring the reader that the remaining chapters of this part are quite as alluring in every respect except that of novelty as the one devoted to dust. These chapters deal in broad yet accurate outlines with the electric telegraph and similar discoveries, lucifer matches, photography, spectrum analysis, physics, cosmic theories, geology and natural selection. We miss in Mr. Wallace's treatment of modern successes only the invention of Bessemer steel and the long-distance transmission of electrical energy.

The second and larger half of Mr. Wallace's work is devoted to what he terms the failures of the present century, and includes the rejection of phrenology and psychical research as subjects worthy of the undivided attention of eminent men of science; some statistical arguments which he believes are absolute proofs that vaccination is a delusion; and chapters on the curse of militarism, on the demon of greed, and on the plunder of the earth.

Phrenology has hitherto been rejected as a concrete science by those best qualified to judge, because it has no "constant," as mathematical men would say. The thickness of the skull is most variable over that very part of the brain which is believed to be the seat of the higher intellectual powers. Pathologists have repeatedly seen cases of accidental injury to the brain substances where functions at first suspended by the injury or loss of a portion of the brain, have subsequently been resumed, thus showing that brain functions are not strictly localized, but may be transferred elsewhere should the necessity arise. If we add to these two damaging disproofs of phrenology, as now understood, the one fact about which psychologists seem agreed, namely, that no classification of the attributes of mind can arrange its component parts in strictly defined independent spheres, we may see that an accurate terminology—the first requisite—is wholly wanting.

We have far more sympathy with Mr. Wallace's plea for a deeper consideration of hypnotism and its allied studies. Here we are willing cheerfully to acknowledge that the palpable methods of weighing and measuring applicable to more material studies may fail wholly to give us the possible results attainable. It may even be that the presence of a hostile critic at attempts to penetrate lesser known psychological phenomena may have an action as disturbing as the proximity of a dynamo would have on a delicately poised magnetic needle. Such facts are only negative disproofs at best, and should be considered as part of the difficulties to be surmounted before the phenomena themselves can be studied with any hope of arriving at the truth. Surely there is nothing more marvelous in "thought transference" than in the action of gravity. In both cases there is action at a distance, through an utterly unknown or
purely hypothetical medium by some means incomprehensible to our senses. Yet, since Newton saw the apple fall and formulated the law of the attraction of bodies to each other, we have all believed in gravitation, though we know no more about how it is carried into effect to-day than its discoverer did two centuries ago. Newton, however, was able to provide himself with a working hypothesis, capable of the widest verification, while the channels through which we must approach the study of obscurer mental phenomena are choked up with charlatanism, fraud, pure hallucinations, mere coincidences against enormous odds and simple self-deceit. We regret that Mr. Wallace utterly destroys the strength of the case by giving as "proofs" of what he asserts a reference to the performances of Eusapia Paladino, who was publicly exposed as a fraud in Cambridge, England, by Mr. Maskelyne, the conjurer (see note on page 211; also, letter from Mr. Wallace to the Daily Chronicle, January 24, 1896). We are firmly convinced that no ground will ever be gained by the employment of professional mediums, while noble and useful minds may be unbalanced by such means. But between the line which shuts out mediums and the line where crass sceptics stand shouting out "animism," "the conservation of energy," and other scientific exorcisms, there is a wide belt of neutral ground, occupied by men like Sir William Crookes and Professor Oliver Lodge.

We have left ourselves no room to speak of Mr. Wallace’s views on vaccination, which must lead him to reject as false and unfounded all the researches of Pasteur and Koch. Nor can we deal with his socialistic methods of feeding the poor, believing, as we do, that the result of putting his plans into action would be starvation, anarchy and the positive decline of our present civilization. The last chapter, however, which he calls, "The Plun-