

in purchasing is taking the place of extravagance. Finally, there is a world-wide increase in living expenses, necessitating increase in salaries, in cost of materials and transportation rates, to such an extent that even in the immediate future success or failure in many manufacturing operations will depend on the extent to which the manufacturer can eliminate waste and increase the value of his product. Speaking frankly and advisedly, and within the knowledge of all, American manufacture is proceeding to a crisis from the successful issue of which only efficiency will count. Most manufacturers now understand this, some of them dimly and gropingly, yet actually.

APPLIED SCIENCE AND SHOP JEALOUSIES.

The American manufacturer, considering him in general terms, to which there are unmistakable exceptions, does not know how to proceed in order to gain this efficiency. For the main part he is ignorant of his own factory problems, at any rate of their full extent. He does not know how to go about the obtaining of adequate chemical aid, or how to choose the chemist, or the laboratory and library facilities with which this chemist should be provided; he submits the chemist to the jealousies of foremen, and by not granting him adequate power, to the stupidity and opposition of workmen; he does not know how to gauge his progress, and consequently subjects him to intolerable conditions of suspicion, intrigue and harassment. For the above reasons 90% of so-called research work carried on in factories is many times worse than loss, because failure places the finale on the possibility of that particular factory to understand the advantages of applied science.

MANUFACTURERS AS AMATEURS IN APPLIED SCIENCE.

Though the facts above stated are valid, it must not be inferred that because of them the American manufacturer is lacking in sense and judgment; for in shrewdness, acumen and energy, he may be compared with the representative manufacturers of any country on earth. His failure in successful factory practice is due, not to lack of ability, but rather to the fact that because of his many abilities he has so far managed to do without efficiency in his factory practice, so that when thrown suddenly into the necessity of this efficiency he finds himself outside his field of knowledge, and hence peculiarly liable to amateurishness and to the mistakes that follow it. The Keely motor and the idea of making gold from sea water are merely gross instances of the general amateurishness that pervades all manufacturing practice wherever it comes in contact with natural knowledge and modern science.

It may be said then, that the American manufacturer is inefficient sometimes to the extent of 50% of the value of his product; that he is confessedly so; and that to-day he knows he is inefficient, though he does not generally know this to the full extent; and that being an American, he is quick to learn and to act, and he desires help. This he can obtain by means of these Industrial Fellowships.

The practicability and value of these Fellowships come from the fact that they truly mirror the spirit of the times, which is steadily and inevitably doing away with the old age of destructive competition and placing in its stead an era of sympathetic co-operation; for men have discovered that they can do together what they could not do in conflict.

From the standpoint of the industrialist this arrangement is an immense privilege. The extraordinary facilities and powers which arise therefrom give him results which cannot be otherwise obtained, and the responsibility for obtaining these results is shifted from the officials of the company, who in most instances are wholly amateurs.