

in the state of perfection in the development of organic beings; and it is only through a thorough knowledge of such "states of perfection" that an inventor can reach the highest success. As is well known, all the modified descendants from a widely diffused species, belonging to a large genus, will tend to partake of the same advantages which made their parents a success in life; the same way with inventions belonging to the same class. Therefore, the law of the development of Industrial Arts implies the preservation of those elements and process-steps that are beneficial to the invention; the discarding of those elements and process-steps that are injurious thereto, and the combining with the beneficial elements or process-steps new elements or process-steps that will make the invention a modern success.

The inventor would naturally take up the art he is most familiar with, and pick out therefrom some invention (and there are many of them) that has failed for want of some improvement, to be most valuable. By studying carefully the state of the art relating to this invention, the inventor will have before him the elements that have made each succeeding invention a success over the immediately preceding ones, and will then have the foundation for the development of further steps. In other words, he will possess the genealogical succession, so to speak, of the beneficial elements. If he is careful, he will combine with the elements chosen from the prior state of the art, new elements that will make the invention a modern success, and thus follow after an industrial manner, the law at work in nature whereby organic beings are developed and equipped so that they can best exist under the then existing conditions of life. By following further this law, it is, apparent that new genera and species of inventions will of necessity be developed from time to time, as are new genera and species developed in organic beings.

The charge may be laid against this plan that it would tend to make inventors less original, that is, cause them to copy too closely the existing inventions in the prior art. But careful thought will dispel this belief, as above noted. Even if an inventor determines to work upon original lines, he must acquaint himself with the prior state of the art, in order that he may successfully keep away from the beaten paths of prior inventors.

It is well known that for every generic invention, there are many secondary inventions. So it is perhaps in connection with secondary inventions that a knowledge of the law set forth in this article will be most useful.

When an inventor goes blindly to work, that is, without any knowledge of the prior state of the art, he spends much time and money in travelling well-beaten paths made by the patient toil of previous inventors; whereas, if he followed out the plan herein set forth, he would soon acquaint himself with the successful and unsuccessful steps made by his predecessors, and act accordingly; this is an indisputable fact.

Because an inventor finds that all through an art certain elements therein have been retained, it does not follow that he need combine these elements in the same manner; the requirements of the case will, of course, determine this, coupled, of course, with the inventor's mental capacity.

I do not say that, between my statement of the law to be observed in developing inventions, and Darwin's Law above cited, there is a complete parallel. The inventor, of course, has more immediate freedom in his choice of combination of elements than if he were working through a process so slow as that of Natural Selection. But it would seem that he is bound to recognize and adopt those elements in prior inventions that have contributed to, or that have been the sole cause of, the success of same.

It is well known that inventors oftentimes find great difficulty in making improvements or fully developing their inventions in order to make them commercial. When these periods or states of non-development are taken into account, it appears to me that there is quite a parallel between the development of an invention (particularly a complicated one), and the Law of Natural Selection. When the inventor cannot at once make the step or improvement he wishes, it

naturally follows that he cannot draw upon his past experience, and his knowledge of the prior state of the art, in order to supply that defect; consequently a mental process (which may be termed Mental Natural Selection—Inventing) must be gone through before the inventor can arrive at the result he is aiming at. The more fertile the brain in which the idea has lodgment, the quicker will the mental powers absorb, so to speak, that idea, and give birth to it in concrete form. So likewise in the development of the organic being; the more suitable the conditions, the quicker will a genus or species be developed that can best exist under the then existing conditions of that period of life.

Darwin states it is notorious that specific characters are more variable than generic. In machines, the main or essential elements we will consider as being the basis for the generic claim. Although they may be modified, these main elements are not subject to the same amount of modification or variation as are the minor elements that are made use of in combination therewith. As is well known, these minor elements are often claimed as means or mechanism for the very reason that they are subject to great variation; that they may be constructed in many different ways and yet be capable of use in combination with the essential elements.

As Natural Selection will never produce in an organic being any structure more injurious than beneficial to that being, it follows that when an inventor proceeds along the right lines of development, he will naturally use elements that will always contribute to the success of the invention. Natural Selection tends only to make each organic being as perfect as, or slightly more perfect than, the other inhabitants of the same country with which it comes into competition. Consequently the properly-directed efforts of an inventor must essentially produce as good or better an invention than those prior thereto, and with which it must inevitably come into competition. The chances are greatly in favor of a better invention being produced, as all inventive effort is exercised for that very end.



THE TORONTO FAIR.

Larger and better than ever seems to be the motto of the management of the Toronto Fair, or to give it a more dignified appellation, Canadian National Exhibition, this year to be held from August 26th to September 11th. The arrangements for holding it and for making it what everybody hopes will prove to be a gigantic success, are now being rapidly completed, and many are the excellent new features.

The special building provided for a display of processes of manufacture will be fitted up this year for the accommodation of binder twine making, the manufacture of many different specimens of pure food, the weaving of carpets, and other forms of textile manufacture, such as cotton and cheese cloth, boot and shoe making, from the raw material to the finished article, Canadian tweeds and other cloths, and a number of other articles, making in all one of the most interesting features of the great exhibition. The demonstrations and the lectures in the Dairy Building at the Canadian National Exhibition will this year, as formerly, be conducted, by experts from the Royal Agricultural College, Guelph, and the various Dominion Experimental Farms. It is also likely that several dairy authorities from the United States will give addresses and conduct demonstrations.

The management is spending close upon \$40,000 upon such special attractions, including the famous band of the Irish Guards, considered by many to be Britain's greatest band, the Windsor Plate, a collection of art treasures loaned by wealthy city of London corporations, the great universities, royal residences, etc.

It is announced that specially reduced rates will be granted by all railroads connecting with Toronto, and besides this there will be special excursions run two or three times per week from points within a radius of 300 miles from Toronto.

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