PATENTS.

The present system of conferring patents upon inventions of public advantage, says Mr. W. R. Hooper, in *Appleton's Journal*, comes down to us from a transatlantic custom of very doubtful parentage. The English monarchs of the sixteenth and seventeenth centuries were wont to bestow on some royal favorite the privilege of the tanning of leather, the sale of salt, or other desirable monopoly. And when freedom, "slowly broadening down from precedent to precedent," had taken away this regal prestige, the same privilege might be acquired by him who could prove that his newly discovered invention would benefit the community. This wild graft of royal patronage, transplanted across the ocean, has burgeoned into one of the most beautiful branches of the tree of liberty. The Patent Office stands side by side with the common school as the ripened development of a distinctively American civilization. In literature, in commerce, in the arts of war, and in many such things, different nations may be our superiors; in a widely diffused education and in inventive genius for labor-saving machines, America leads the world.

As at present systematized, the grant of a patent is in the nature of a contract. Government says to every man of inventive skill that, if he will apply his mind and his capital to invention, and shall develop an improvement upon any existing "art, machine, manufacture, or composition of matter," he shall enjoy the benefit of his invention for the next seventeen years; at the expiration of that time the invention is to become the property of the public. So well is this contract appreciated that, short as has been our national existence, one hundred and ten thousand persons have already entered into it, and fifty thousand more applied and were rejected. The number of applications for patents steadily increases, as well as the objects of invention. These applications now arrive at the capital at the rate of twenty thousand a year.

It is the general opinion of those who study our patent system as a science that we are just on the verge of new discoveries that shall benefit the world more than any past invention. We have bridled the lightning and taught it to carry messages: but suppose the awful force of electricity, that can crush the hardest rock and bring a more tremendous power to bear instantaneously on a given point than any other known motor, should be as subject to our control as steam is! In that instant the motive power of the world is more than doubled. Within twenty years the burden of sewing has been taken off the mother and sister and put on the machine. Suppose the flying wind that hovers over our roofs should be imprisoned and so used that it should perform all our domestic labor before the airy captive should escape! There is no power on earth so great, so steady, so massive, as the tide. Twice each recurring day it lifts the whole body of sea water a number of feet into the air. It penetrates up every creek and stream and river, forcing the water to rise and overwhelm the solid land. Should this immense amount of tidal power, that envelops the whole world, become subject to the will of man and forced to do his building, we should have an instrumentality to bear the burdens of mankind infinitely more powerful and more general than anything now in use. We travel to-day on solid earth; should some of the numerous applicants for patents for the use of balloons or flying machines happen to succeed, and we should all take to travelling upon the wings of the wind, what would become of railroads and turnpikes and steamboats? Nor are these idle speculations. The employment of lightning, of wind, of tide, of air, will not seem so strange to our enlightened children as the telegraph, the sewing machine, the railroad, and the steamboat, seemed to their grandparents. The child may now be living who will yet see them all the willing slaves of man, joyous to do his bidding in the service of humanity.

The vast majority of patents contain no remarkable invention; they merely make some slight progress upon existing facts. Not in one great tide of invention does improvement come, but rather in small, gentle waves, each advancing almost imperceptibly further than its predecessor. And it is that slight difference that gives success to patents. The inventive mind is so constantly on the stretch that similar claims are constantly made by rival inventors. When petroleum first began to enlighten our darkness, there were twenty-five claimants at one time before the office, all asking for substantially the same mode of raising oil out of the solid earth. And when velocipedes so suddenly leaped into fashion a few years ago, four hundred and thirty-two applications for velocipede patents were filed within four months, and of these thirty-three were contemporary claims for the same idea. Every spring brings forth a crop of stove patents, each manufacturer preparing for the coming winter by striving to surpass his rivals in the prettiest pattern and the greatest warmth-giving power. Few persons think much of the form of the lamp they buy; yet lamp patents are renewed every year. At one time the student lamp, with an argand burner, yields its manufacturer a small fortune; the next year some fortunate genius notices that two wicks give an imperceptibly larger light than the argand; and the patent he obtains brings him prominence in all the lamp markets in the country. One of the most essential elements in patents is novelty; yet applications are continually made for patents based on ideas as old as the Christian era. Pliny, writing in the first century, describes harvesters for heading grain as then in existence on the plains of Gaul; and Paladius mentions them again in the fourth century; but both of these lacked some idea that would adapt them to general use. Tailors' machines were in smooth running order in Paris long before Hunt and Howe perfected the present invention. It remained for the Americans to lighten the domestic cares of the female sex throughout the world.

Most patent rights are limited in their application, and never attain a general circulation. But a patent of wide use, however small the royalty it pays, benefits the happy inventor with a large profit. Inventions for sewing machines, of which one company makes about three thousand a week, inventions for the use of India rubber, for agricultural implements, fire arms, and modifications of leather and paper, have accumulated fortunes. Nor is it possible to tell the extent of the ramifications of a patent. A few years since, all the dentists of the country combined to break an India rubbia patent; every one of them had to pay a royalty whenever he inserted a set of teeth in vulcanized rubber. Their combination failed, and the royalty still is paid. One of the most profitable patents ever issued in this country was for the manufacture of horseshoes. In England one of the most lucrative has been the Bessemer manufacture of steel. Most patents concern themselves with agricultural or domestic labor. In one year two hundred and twenty patents were granted for cultivators, two hundred and ten for plows, one hundred and eighty for churns, one hundred and seventy five for washing machines, one hundred and fifty-one for sewing machines, one hundred and forty for stoves, and another hundred and forty for gates. Nearly eighteen hundred patents have been issued for sewing machines and their attachments; and the applications for newer inventions come in daily.

For these applications for patent rights increase much faster than the population. In 1851 there were two thousand of them; in 1870 nineteen thousand one hundred and seventy-one, of which thirteen thousand three hundred and twenty-one were granted. Inventive skill does not depend upon education. Prussia is as well educated as this country; but in 1867 only one hundred and three patents were issued in Prussia, as against thirteen thousand in this country. Vermont has as good schools as Massachusetts; but the Bay State secures ten per cent of all the patents granted to the nation, while the Green Mountain State has less than one per cent. To quicken the inventive mind demands a large amount of capital engaged in manufacture, a skilled body of workmen, and a profit in the improvement of manufactures. Where these coexist, patents are in demand.

As a general rule, valuable inventions are the results of long years of close thought and much expenditure of time and money. Capital never offers itself to the inventor without the promise of an enlarged and speedy return. Nor do valuable ideas often enter the mind of the outsider on any subject. Abraham Lincoln was a very able lawyer of Illinois when in May, 1849, he obtained a patent for lifting steamboats over river bars; but it may be doubted if that patent has ever been used, or would have been applied for by a marine engineer.

Curiosities of Natural History.

We cull the following from a recent lecture in London by Mr. F. Buckland: He began by declaring that he was utterly opposed to the Darwinian theory of "development," and then explained the grounds on which his opposition rested. Man, he said, is unarmed, and his position of supremacy over all created beings taught him to invent what Nature had not given him, that is, weapons of offence and defence. The first instrument found by man is a common stone; this he cuts and adapts to his use till he makes knives, arrowheads, and hatchets, which afford him the means of securing his prey, making war on his enemies, and manufacturing other implements, such as wooden clubs, which could not be wrought without the aid of harder substances. He showed a massive club from New Zealand, which he recommended to the Chief of the Police as a preferable weapon to the "staff" used by the policemen: though he believed that such an unwieldly affair was used rather as a sign of authority—by the Lord Mayor of New Zealand perhaps—than as a weapon of warfare. In contrast to this large club, Mr. Buckland exhibited some small South American arrows, or puff darts, only a few inches long, and poisoned with some mysterious matter called wourali, which he believed might be snake poison. These arrows are blown through a small tube, and are so deadly that the moment anything is struck by the arrow it dies. The *virus*, however, is only fatal when mixed with the blood externally, and an animal thus killed has no ill effects on the person eating it. Thus from flints—a fine specimen of which, found among fossil elephant bones at Hoxne, in Suffolk, was exhibited—through clubs and arrows, man has gone on inventing weapons till he has now the deadly Snider, with which we civilized people are as ready to kill one another before we have ever seen each other, as the savages of Africa or of the South Seas with their less refined weapons.

Animals, on the other hand, have their arms found for them. Witness the lion, with his teeth and claws; the viper with its poison fangs; the elephant with his tusks; the torpedo with its electric battery. Man is not descended from a monkey. What monkey ever invented a weapon? Mr. Darwin has mistaken the law for the by law. It is true that from the sponge, the lowest in the scale of created organisms to man, there is a certain similarity of structure. Mr. Buckland showed by a simple diagram the ascending scale of creation, from a sponge—a simple stomach—upwards through the various classes to the head of all, man; but, he added, between man and beast, between man and monkey, there is a hard line drawn—a great gulf fixed. When a monkey walks as upright as he can, he is in a stooping position; his hands hang down, and he never raises his arms except to seize some support. When a man in the circus, or in the street, tries to imitate a monkey, he throws his arms up in the air—which a monkey never does. *Os homini sublime dedit.* The similarities in structure exist, but they exist through design, through a special adaptation of them to the various conditions of the animals possessing them, and are no more caused by "development" than a hungry man's appetite is satisfied by wishing for something to eat.

The cast of an immense hand of a gorilla was passed round, and Mr. Buckland asked if any young lady would like to honor her "poor relations" by accepting such a hand. It measures nearly six inches across and eleven inches long.

Speaking of poisoned arrows leads us to poisonous snakes. Mr. Buckland said he could not understand the antipathy that existed in man's mind against snakes. Some years ago he was entertaining some natives of New Zealand at his house—not that he could speak New Zealand to them, or they English—but, after conversing with them by means of roast beef and plum pudding, he produced a dead snake. Such things as snakes do not exist in New Zealand, and probably none of his guests had ever seen one before; but immediately it was produced they drew back, and raised a loud shout of fear, thinking that some harm would befall them. We might be allowed here to suggest that we have, in this dread that man has of snakes, another indirect proof of the truth of Holy Writ—that the "enmity between the seed of woman and the seed of the serpent" exists in reality, and will exist as long as the curse lasts.

But to return to the lecture. Mr. Buckland explained the controversy which has been raging, and which has been recorded in *Land and Water*, about "vipers swallowing their young," and showed a box containing a family of the father and mother and seven little vipers, which he excited great laughter by stating he was doing all in his power to induce to swallow, or be swallowed, though he doubted if they would do it to oblige him, any more than he would swallow his young to oblige any one else. He then exhibited casts of various species of venomous and non-venomous snakes, and a large skin of a boa constrictor, 16 feet long, showing the beautiful markings of the animal. He then passed round a preparation showing the poison glands and fangs of a viper *in situ*, explaining that when a snake attacks its prey it does not bite, but pricks it, allowing the *virus* to run down the fang or tooth, which is hollow, into the puncture. A short time since a rattlesnake died at the Zoological Gardens, and Mr. Buckland took the rare opportunity thus offered of making experiments to test the nature of the poison. The appearance presented by the *virus* when examined through the microscope was very peculiar, the liquid crystallizing very rapidly and throwing out *spiculæ* or radiating lines, similar to the coruscations of the aurora borealis and representing most probably the darting action of the poison when injected into a wound. The snake who was the object of this unique discovery was in its death a warning against greediness; it had had two guinea pigs given it one day for its dinner, and instead of eating one at a time, as a good rattlesnake would have done, it swallowed both at once and died, and so fell a victim to gluttony and guineapigism." Apropos of the food of snakes, the lecturer explained why they are fed with white mice instead of brown ones at the Zoo. He had often heard ladies exclaim: "How cruel to feed the horrid snakes on the pretty white mice," while the common brown mice in such a case would have received no pity. A brown mouse, if the snake does not eat him, will eat his way out of the cage, and thus show his gratitude to the snake for not devouring him by making an aperture through which Mr. Snake can also make his exit, while a white mouse will not attempt such a burglarious mode of escape. But why should the white mouse be pitied in such a death more than a brown mouse?

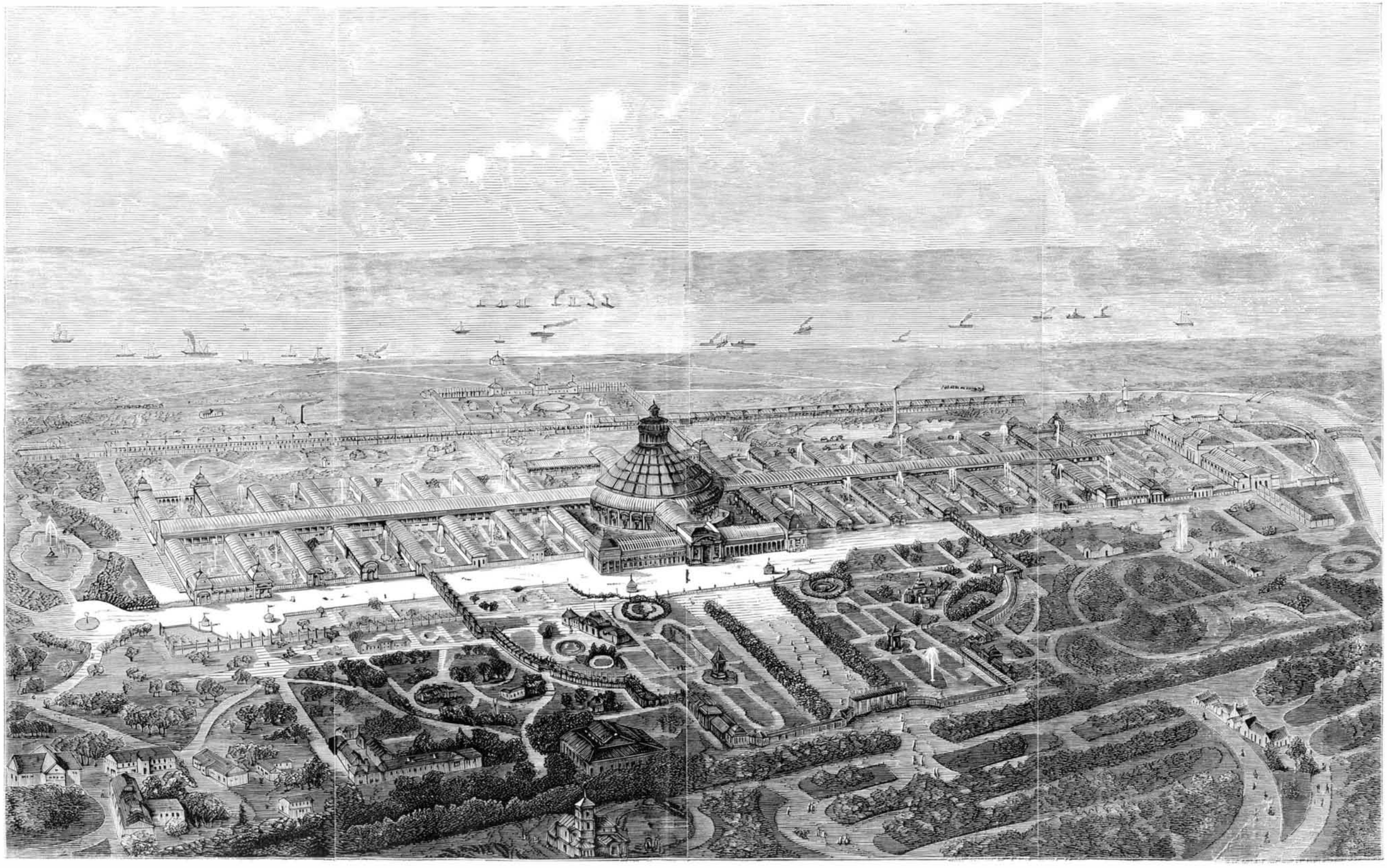
The Man of Long Life.

He has a proper and well proportioned stature, without, however, being too tall. He is rather of the middle size, and somewhat thick set. His complexion is not too florid; at any rate, too much ruddiness in youth is seldom a sign of longevity. His hair approaches rather to the fair than the black; his skin is strong, but not too rough. His head is not too big; he has large veins at the extremities, and his shoulders are rather round than flat. His neck is not too long; his abdomen does not project; and his hands are large, but not too deeply cleft. His foot is rather thick than long; and his legs are firm and round. He has also a broad, arched chest, a strong voice, and the faculty of retaining his breath for a long time without difficulty. In general, there is a complete harmony in all his parts. His senses are good, but not too delicate; his pulse is slow and regular.

His stomach is excellent, his appetite good, and his digestion easy. The joys of the table are to him of importance; they tune his mind to serenity, and his soul partakes in the pleasure which they communicate. He does not eat merely for the pleasure of eating, but each meal is an hour of daily festivity; a kind of delight, attended with this advantage, in regard to others, that it does not make him poorer, but richer. He eats slowly, and has not too much thirst. Too great thirst is always a sign of rapid self-consumption.

In general, he is serene, loquacious, active, susceptible of joy, love and hope; but insensible to the impressions of hatred, anger and avarice. His passions never become too violent or destructive. If he ever gives way to anger, he experiences rather a useful glow of warmth, an artificial and gentle fever without an overflow of the bile. He is fond also of employment, particularly calm meditation and agreeable speculations, is an optimist, a friend to Nature and domestic felicity, has no thirst after honors or riches, and banishes all thoughts of to-morrow.

AT the Zoölogical Gardens, London, a recent event of some interest is the birth of a hippopotamus. The babe is three feet six inches long, weighs one hundred pounds, and is of the color of a polished mahogany dining room table. It suckles continuously, and enjoys life very much



THE BUILDINGS OF THE VIENNA EXPOSITION.—(See page 376.)