

Out of the rat-like marsupials, by the formation of the placenta, development of the commissures of the brain, etc., come the semi-apes, of which the lemur (20) is an existing type. From the semi-apes, by the transformation of the jaw, and by claws on the toes becoming nails, arose the narrow-nosed tailed ape (21). Then the tail disappeared, the hairy covering partially departed, and the brain above the facial portion of the skull developed, producing the orang-outang (22), or the chimpanzee, or the gorilla—the human apes of the miocene period. These apes gradually became accustomed to an upright walk, and the separate pairs of legs differentiated. The fore hand became a human hand, the hind one, a foot. Thus was produced the ape man, the pithecanthropus (23), who existed toward the end of the tertiary period. Genuine man developed out of the ape-like man by the gradual development of the animal language of sounds into a connected and articulate language of words. These went hand in hand with the higher differentiation of the larynx and the brain. Primæval man, Hæckel divides into the straight haired and the woolly-haired. From the last arose the Papuans (24), the oldest of all still living human species, and nearest related to the original primary form of woolly-haired men. Next come the Hottentots, belonging to the same branch as the Papuans. To the other branch belong the Negroes and the Kaffirs.

The straight-haired men generated the Australians and Pro-Malays, the latter, the Mongols and the Malays. The Mongols produced the eighth and ninth species, the Americans and the Arctic Men, and the last produced the Esquimaux. The Malays have developed into no other distinct species. A third branch of the Pro-Malays, however, produced the Dravidas, from whom sprang the Cingaleses, the Nubians, and the Mediterranees, thus completing the series of twelve species and thirty-six races.

Tracing, lastly, the history of nations or historic tribes, the Mediterranean gave rise to four races, the Semites and Basques in one branch, the Indo-Germans and Caucasians in another. From the Indo-Germans, in regular progression, came Sclavo-Germans, the primeval Germans, the Germans, Low Germans, Saxons, and, lastly, Anglo Saxons. And here our chronicle ends, for thus over a lapse of thousands of millions of years—ages, according to Hæckel, countless and incalculable save by mere approximation—we have traced the development of man from the clot of albumen to the race which now populates these United States.

The Heat of Slags and Economy of Furnaces.

From two recent papers of Professor Grüner we obtain the following interesting data: The experiments on which they are based were made with a water calorimeter of 18 kilogrammes (nearly 40 lbs.) weight, and upon quantities of molten material varying from 50 to 100 grammes (1.6 to 3.2 ozs.). The heat is given in French calories, or centigrade units.

The less fusible slags of the blast furnace (accompanying gray pig) possess, on issuing from the furnace, 450 to 500 units. Those proceeding from non-fusible ores, and most frequently associated with white pig, have 400 to 450; white glass (70 per cent silica) heated to the temperature for glass-blowing, 415 to 420; bottle glass under the same circumstances, 380 to 400. The ferruginous and manganiferous scoriae from the Martin process (54 to 55 per cent silica) require for smelting 410 to 415 units; porphyroidal copper slags from Swansea (60 per cent silica and quartz), 405 to 410; bisilicate protoxide of iron slags (45 per cent silica), 380 to 400; puddling or reheating cinder (30 to 35 per cent silica), 320 to 330; monosilicate slags from lead and copper furnaces (28 per cent silica), 275 to 300. Pure, well carburized pig requires for melting 225 to 230 units; gray silicious pig (3 per cent carbon), 250 red copper, which, like the foregoing, has its melting point at about 1,200° C. (2,192° Fah.) may be brought to that temperature with 160 to 165 units of heat. Iron copper matte requires 230 to 240; iron lead matte, 200. Lead, which has, like platinum, a very low specific heat, can be brought to clear orange redness with 45 to 50 units.

From the foregoing figures, and other researches which he has previously made public, Professor Grüner has deducted the following interesting statements:

In the wind furnace, which is from this point of view the most imperfect apparatus, there is utilized, in the fusion of steel in crucibles, but 17 of the total heat capacity of the fuel, or at most 3 per cent of the heat generated. In the reverberatory, when steel is melted in crucibles, the useful effect is 2 per cent of the total heat, or 2 per cent of the heat generated. In the Siemens crucible furnaces, 3 to 3.5 per cent; in Siemens glass furnaces, operating on a large scale, 5.5 to 6 per cent; in ordinary glass furnaces, 3 per cent; in fusion upon the open hearth of a reverberatory, of glass, 7 per cent; of iron, 8 per cent; in well arranged Siemens and Ponsard furnaces, up to 15, 18, and even 20 per cent of the total heat is utilized.

The calorific effect is much greater when the fuel is mixed with the material to be fused. In old cupolas, 29 to 30 per cent; and in modern cupolas, higher, more rapid in working, and narrower in zone of fusion, upwards of 50 per cent is realized. Large iron blast furnaces utilize, according to their working, 70 to 80 per cent of the heat generated, or 34 to 36 per cent of the total heat which the complete combustion of the fuel would set free.—*Engineering and Mining Journal.*

Cat Racing.

Since the siege of Paris a great deal of interest in the breeding and training of homing pigeons has been created by the admirable service rendered by these swift-flying messengers from the besieged inhabitants of that city to friends

outside. The birds in which the homing powers were found to be most strongly developed were of a breed of Belgian pigeons now pretty generally known as Antwerps. This homing faculty, it seems, a Belgian society is now endeavoring to develop in the domestic felines of that country by inaugurating cat races, on much the same principles as pigeon-flying matches. A cat race was very recently instituted in Liège. There were thirty-seven competitors, all of which were liberated some distance from the town, and the prize was awarded to the animal which reached its home in that town first. They were started at 2 P. M., but the distance they had to traverse is not stated; suffice it to say, the first prize animal won in a canter, as he arrived at home at 6:48 P. M. the same evening, the second cat not appearing until 2:24 A. M., the following morning.

DECISIONS OF THE COURTS.

United States Circuit Court—District of Massachusetts.

R. C. ANTHONY *et al.* vs. JOHN CARROLL.—ASSIGNMENT OF CLAIMS FOR PATENT DAMAGES.
[In equity.—Before SHEPLEY, J.—Decided October, 1875.]

SHEPLEY, J.:
This bill in equity, filed July 27, 1874, alleges the grant of letters patent of the United States to Marie Amédée Charles Meiller for a new and useful machine for making paper pulp; the assignment by Meiller, to one Buchanan June 19, 1857, of all Meiller's right and title to the invention secured by the letters patent; the assignment by Buchanan to Buffam, trustee of the American Wood Paper Company, October 14, 1863; and the assignment by Buffam to that company, June 16, 1865, of his legal estate in the patent. The infringement by the defendant, and consequent profit to defendant, and damage to the American Wood Paper Company, is alleged from October 14, 1863, to August 19, 1867.

The bill alleges an assignment, August 19, 1867, from that company to Gardner Harland of "all their claims against the said defendant for the said damages and profits for the said infringement during the said period," and an assignment by Harland to R. C. Anthony, one of complainants, October 4, 1873, of all said claims. The bill is brought by R. C. Anthony, a citizen of New York, and the American Wood Paper Company, a corporation created by the Legislature of the State of Rhode Island and located at Providence in said State, against the defendant, a citizen of Massachusetts, for a discovery and account of profits, and for damages and other relief.

The defendant has demurred generally to this bill, and in support of his demurrer relies upon the bar of the statute of limitations of the Commonwealth of Massachusetts, and also upon the character of the claim alleged in the bill as that of a claim in tort in this Commonwealth is six years. (Gen. Stat. of Mass., Ch. 155, Sec. 1.)

A general rule, the law of the State in which anational court sits must be the rules of decision in such court. The thirty-fourth section of the judiciary act provided that "the laws of the several States, except when the Constitution, treaties, or statutes of the United States shall otherwise require or provide, shall be regarded as the rules of decision in trials at common law in the courts of the United States in cases where they apply." It is too well settled to require the citation of authorities that, in ordinary suits at common law, the statutes of limitation of the State where the suit is brought may be pleaded in bar under this provision of the judiciary act.

Whenever the cause of action is one cognizable by a court of common law, a court of equity, in accordance with the general rules of equity jurisprudence, follows the law in relation to the limitation of actions. The question presented is whether this rule applies to actions, the subject matter of which is under the exclusive control of the national legislature and judiciary.

Mr. Justice Swayne held, in the case of Collins vs. Peebles (2 Fisher, 541), that the State statutes could not limit the time within which actions for the infringement of letters patent might be brought in the courts of the United States; that Congress having failed to legislate upon this subject, the law is to be taken from the common law, and the statute of limitations of the State where the suit is brought may be pleaded in bar under this provision of the judiciary act.

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The English patent was not sealed previous to the 15th of June, 1854. It was taken out surreptitiously by some one who, without the knowledge of the American inventor and without authority from him, endeavored to appropriate the benefits of his invention. If a person had thus surreptitiously taken out letters patent in this country for the invention of another who was diligently perfecting his invention, he would not thereby have deprived the real inventor of any rights. It is not believed that, by taking out in advance an English patent, he could accomplish more than he could have done by taking out letters patent in this country. Moreover, as the English patent was not sealed prior to June 15, 1854, it was not more than six months prior to the application for letters patent in this country; and under the act of 1836, he had a right to take out his patent in this country for the full term, although he had taken out one in a foreign country, the same having been published at any time within six months next preceding the filing of his specifications and drawings. The act of 1839 was not intended to limit the inventor's rights under the act of 1836, but to enlarge them. He still had the right to take out his patent for the full term, notwithstanding that he had obtained and published a foreign patent within six months. But after the six months he had, for a further specified time, a right to take out his patent, subject to the conditions and specifications specified in the act of 1839. But the provision in the act of 1839, with reference to the effect of his invention, having been patented in a foreign country more than six months prior to his application, evidently refers to the fact of its having been patented by him, the applicant for the American patent.

In the interlocutory decree made on the motion for a preliminary injunction, and in what has hereinbefore been stated upon the subject of infringement, reference has been had solely to the infringement of the third and fourth claims of the reissued patent. The question of infringement of the eighth claim remains to be considered.

The eighth claim is for—
"8. The combination of the sliding bar, or its equivalent, and the rods acting together, substantially as described, whereby the loom is preserved after it is formed, and the heddles are drawn away from the locality where they are formed on the stationary slats, and the movement of the sliding bar, or its equivalent, and the bands attached thereto, to which heddles are tied in the process of formation."
Winsor's rights under this claim also are to be considered in the light of the fact that, prior to the date of his invention, there had never been a machine constructed in which was organized any apparatus for making the difficult side of a weaver's harness, combined with a sliding bar, or its equivalent, for drawing away the heddles, nor had there, prior to the invention of Winsor, been any machine having any combination of the sliding bar, or any equivalents of any such rods as are described in the Winsor patent, for receiving and preserving the loom after it is formed. The evidence in the record proves that the Winsor invention antedates any devices which are relied upon as anticipating this portion of the Winsor invention.

In the Ellis and Sladdin machine we find the same sliding bar for removing the heddles from the locality where they are formed, combined with automatic arrangements for making the heddles. We find, also, slats securing and preserving the loom supported by one end only, as in the Winsor machine, so as to afford the facility of securing the twine at one of their sides or the other by passing them by the end, and by receiving them as they are formed upon the free end, in combination, as in the Winsor machine, with the screws and yoke for moving the heddles along. The Ellis and Sladdin devices appear to be equivalent devices acting in the same combinations to accomplish the same result of preserving the loom after it is formed; and although they, by assisting to form the loom, do more devices do in the Winsor patent, that does not relieve them from liability to the charge of infringement.

The defendants must, therefore, be held to have infringed the third, fourth, and eighth claims of the reissued patent.
Decree for injunction and account as prayed for in the bill.
[Chauncey Smith, Benjamin F. Thurston, and William W. Swan, for complainant.
Benjamin F. Butler and A. K. P. Joy, for defendant.]

NEW BOOKS AND PUBLICATIONS.

THE ELEMENTS OF PHYSICAL GEOGRAPHY, for the Use of Schools, Academies, and Colleges. By Edwin J. Houston, A.M., Professor of Physical Geography and Natural Philosophy in the Central High School of Philadelphia. Price \$1.75. Philadelphia, Pa.: Eldredge and Brother, 17 North Seventh street.

This is one of the best school books that we have lately received. It is full of information, which has been thoroughly condensed without losing any of its clearness of explanation; and it is written in a style to interest the young reader, and to induce him to give proper attention to every branch of the subject. The maps and other illustrations are excellent, and the book is evidently the work of a writer who knows how to teach.

THE ECONOMY OF WORKSHOP MANIPULATION, a Logical Method of Learning Constructive Mechanics. Arranged with Questions for the Use of Apprentice Engineers and Students. By J. Richards, Author of a "Treatise on Woodworking Machines," etc. New York city: E. & F. N. Spon, 446 Broome street.

Mr. Richards' works on the economy of the mechanical arts are well known, and his new book will enhance his reputation as a fluent and pleasing writer. His views are always sound and enlightened, and his precepts deserve to be learnt by heart by every young mechanic. The chapter on mechanical drawing in the book now before us is an excellent piece of instruction.

THE POLYTECHNIC REVIEW, Devoted to Science as Applied to the Useful Arts. Published Monthly. Subscription \$3 a year, payable in advance. Philadelphia, Pa.: Drs. Wahl & Grimshaw, 119 South Fourth street.

This publication is intended to occupy some portion of the extensive field in which we are diligently laboring, and to present to its readers, monthly, all the current information on the many subjects included under the generic name of Science. Its first number has a creditable appearance.

PAPERS RELATING TO THE FOREIGN RELATIONS OF THE UNITED STATES, transmitted to Congress with the Annual Message of the President, December 6, 1875. In Two Volumes.

NOTES ON THE YUCCA BORER. By Charles V. Riley, Ph.D. St. Louis, Mo.: R. P. Studley Company, 221 North Main street.

SCRIBNER'S MONTHLY for March offers its usual attractive table of contents. The number opens with an excellent description of the new buildings of Trinity College, Hartford, Conn., with illustrations. The architecture of these proposed edifices is altogether different from that of any other college buildings in the country, and will attract considerable popular interest. The kindergarten system of instructing very young children is clearly expounded by Dr. Eggleston. Mr. Dorsey Gardner writes upon the struggles and successes of Wilson, the celebrated ornithologist. The editor has some thoughtful essays on "Public Halls" and "Common Schools." Mr. P. T. Quinn contributes some timely directions about laying out small places and suggestions relating to rural topics, and there is a goodly variety of entertaining serial and short stories. Subscription price \$4 a year. Scribner & Co., publishers, 743 Broadway, New York.

ST. NICHOLAS for March is, as usual, preternaturally good. If the editor would occasionally introduce something poor within its covers, we should be half inclined to welcome it as a pleasing variety, just as a discord in music often adds to the beauty of the surrounding harmony. Mr. Whittier sends a new and beautiful poem, Mrs. Oliphant the beginning of a series of interesting papers on Windsor Castle, Mr. Charles Dudley Warner and Mr. Bayard Taylor contribute interesting sketches of foreign countries, Miss Alcott continues her pleasant talks; in fact, we cannot pretend to tell half the good things with which the youngsters are provided. The illustrations are as charming in subject and variety as they are artistic, and that is saying a great deal. Subscription price \$3 a year. Scribner & Co., publishers, 473 Broadway, New York.

THE ATLANTIC MONTHLY for March begins with Mr. T. B. Aldrich's new poem "The Legend of Ara Coeli;" Mr. John Fiske concludes his papers on the "Unseen World," imparting results of modern scientific religious thought; Mr. Charles Francis Adams publishes the first chapter of his excellent essay on the "State and the Railroads," one of the most valuable and thoughtful contributions to the literature of the railway that we have ever read. The beauty of inflation and the advantages of a paper currency Mr. Henry Carey Baird attempts to show in an article, none the less well written and interesting, even if its writer, in the opinion of most people, is on the wrong side of the present important financial controversy. Mrs. Fanny Kemble continues her pleasant "Gossip," Mr. E. W. Jones tells us some new facts about the Welsh in America; and besides a variety of short poems by Dr. Holmes and other well known writers, the editor contributes his usual careful and critical reviews of current literature. Hurd & Houghton, publishers, New York and Boston. \$4 per year.

THE ALDINE.—The Aldine Company, 18 and 20 Vesey street, New York, have issued, of this year's numbers, Parts 1, 2, 3, and 4. The engravings, letterpress, and paper are all of the highest standard of art work. Published fortnightly at 50 cents a number, and sold only to subscribers. The publishers announced it as their intention to make it the leading art journal of America. They are fulfilling their promise.