

An extremely interesting table in the report is that showing the number of patents issued in each State and the ratio of population to each patent granted. New York, as we should expect, heads the list with a total issue of 3,798 patents, followed by Pennsylvania with 2,355, Illinois with 2,152, Massachusetts with 1,774, and Ohio with 1,501. In the table showing the ratio of population to patents issued the citizens of Connecticut are found to hold a long lead, one patent being issued to every 945 inhabitants. Next in order are the following: District of Columbia, 1 to every 1,151; Massachusetts, 1 to every 1,262; Rhode Island, 1 to every 1,270; while New York comes eighth, with 1 to every 1,579. The fewest patents granted in proportion to the number of inhabitants were in the Southern States, South Carolina receiving 1 to every 25,024 inhabitants; North Carolina, 1 to every 21,012; and Alabama, one to every 17,195. It is thus that the New England States continue to stand pre-eminent for the inventive and mechanical bent of its people.

The statistics of patents granted to foreign inventors show that England maintains her lead, with Germany a good second. There were granted to residents of England 1,072 patents, and to those of Germany 888, while Canada received 371 and France 292. In making a comparison of the past four years we find evidence of a growing appreciation among foreign nations of the value of United States patents. The most remarkable figures are those for England and Germany, which have risen respectively from 617 to 1,072 and from 543 to 888. Canada, although possessing not over one-sixth the population of France, is a more frequent applicant at our patent office, 371 patents being granted in Canada as against 292 in France. Indeed in proportion to her population, Canada takes out by far the most American patents of all foreign countries.

UNITED STATES PATENTS GRANTED TO FOREIGNERS FROM 1896 TO 1899.

	1896	1897	1898	1899
England.....	617	706	964	1,072
Germany.....	543	551	634	888
Canada.....	244	286	345	371
France.....	194	222	258	292

That the examining work of the office has been kept well in hand is shown by the fact that while there were 5,467 applications awaiting action on December 27, 1898, 5,392 were awaiting action on December 26, 1899, and at both dates substantially all of the divisions were taking up amended cases for action, within 15 days after the amendments were filed.

A considerable portion of the report is taken up with a description of the "classification division," which has been actively at work through the year, and Commissioner Duell is able to report "considerable progress" although we note that the long-standing complaint of "lack of room" has still to be made. Limitations of space prevents any detailed review of the new system of classification, and we refer our readers to the current issue of the SUPPLEMENT where the report is printed in full. It is sufficient to say that the system adopted, being based upon the accumulated experience of over 60 years of work is comprehensive and adequate to the solution of a complicated and difficult problem,—how difficult and complicated may be judged from the facts that the present field of search consists of about 700,000 United States patents, 1,250,000 foreign patents and 74,000 volumes in the Patent Office library.

We regret to note that the Commissioner's expectation that in a few months some additional room would be placed at the disposal of the Patent Office has not yet been realized. Even when the Land Office vacates the Patent Office building, adequate accommodations will be wanting. Proper provision for the Patent Office and the construction of a fireproof building for its records are among the crying necessities of this institution.

The report concludes with the statement that the Commissioners appointed by Congress to revise the statutes relating to patents, trade and other marks has submitted a preliminary report and will shortly present a full report on this most important question. The Commissioner further states that a feature of this report which is of particular interest will be a proposed revision of the trade mark law to provide for the registration of trade marks used in interstate commerce, and to encourage a more generous registration of trade marks by reducing the registration fees.

The attention of Congress cannot be too strongly invited to the necessity of taking some measures to give manufacturers greater protection in regard to their property rights in trade marks. No more crying evil exists to-day than the anomalous condition of our trade-mark practice, and it is high time that the manufacturers of the country should demand legislation for protection of their rights, especially at a time when our foreign trade is advancing by leaps and bounds and American manufacturers are competing so successfully with foreign competitors in their home and colonial markets.

## CALIFORNIA BIG TREES THREATENED WITH DESTRUCTION.

A project is seriously entertained by a company of lumbermen to cut down the grove of "Big Trees," which form one of the most striking natural features of Calaveras County in the State of California. These trees are perhaps one hundred in number and was discovered in 1852. Their fame has grown with the years, and thousands of visitors have gazed in amazement at these sublime instances of forest growth.

Compared with the greatest of trees in other parts of the world, they dwarf by their magnificent dimensions any others now known.

The Calaveras grove is situated near the Stanislaus River, about twenty miles distant from Murphy's Camp. Visitors to the Yosemite Valley often go out of their way to gaze upon these wonders, though, until recently, the trip involved a long and dusty journey.

A new railroad has invaded the locality and, consequently, has made the marketing of the timber a commercial possibility. A sawmill is being erected on the spot and operations are threatened with the advancing season. The prospect of a wholesale mutilation of the grove is imminent and the entire State is aroused at such a sacrilege. There are but a few groves of these trees in the Sierra Nevada's. None outside California. At Mariposa and on King's River there are scattering trunks but great as they are, there are none that compare in girth or altitude to those of Calaveras. The Sequoia gigantea is arrogant in its choice of locality, while the redwood, Sequoia temper rireus, flourish in profusion on the coast, in an atmosphere of fog and mist. The Sequoia gigantea lives only on the western slope of the Sierras, and derives its nourishment from the dry warm sunshine of the south. Beyond the latitude of San Francisco it will not flourish and either above or below an altitude of from 4,000 to 6,000 feet it grows only in dwarfish form. Efforts to transplant under other conditions, than these have all resulted in failure, only in England does partial success encourage the trial. In their native haunts the immense size of these trees is hardly comprehended. The Grizzly Giant is over 40 feet higher than the spire of Trinity church, New York. Its trunk at the base is 93 feet in circumference and 31 feet through. The height to the first limb is over 150 feet and these are from 3 to 6 feet in diameter where they spring from the trunk. The proportions are fine, and its age is estimated at 3,000 years.

There are in all only about one hundred of these trees, all confined in an area of 2,000 acres. It is believed that some of those which have succumbed to age and the elements attained an altitude of 450 feet. The wood is different in color from the redwood, being dark brown, but is equally useful. As a cabinet wood it has no superior. The amount of lumber contained in one of the larger of these trees is said to exceed 250,000 feet. Compared to the redwood the greatest of the Sequoia gigantea will grow to more than double the height the former ever attains. The people of California are unanimous in their determination, that the Calaveras grove shall not be destroyed. This will involve the purchase of the land, and provision for future care.

## DISSOCIATION OF AIR AT ORDINARY PRESSURE.

Prof. Raoul Pictet, of Geneva, Switzerland, whose name is identified with the early liquefaction of air and gases, recently made a demonstration, says The N. Y. Sun, of a process of his invention for the separation of the oxygen and nitrogen of the air at ordinary pressure.

It is said that the process is one that is about to be introduced in this city on a commercial scale. Prof. Pictet's process as described consists in the initial production of a certain quantity of liquid air which is stored in tubes. Then through this is forced under a pressure of only about one atmosphere or fifteen pounds to the inch a stream of atmospheric air. This is cooled in the liquid air, but as it rises in a chamber beyond the gases of which it is composed separate themselves by gravity and run off in separate tubes. The oxygen being slightly the heavier, flows out through the lower tube, while the nitrogen goes off above. In addition to these gases, the air contains as an impurity carbonic acid gas, and this, it is asserted, leaves the machine in a liquid form being reduced to that form by the low temperature. In ordinary liquid air as it is produced by Tripler, Ostergren and others, the carbonic acid gas is frozen and gives the liquid air a milky appearance. It is taken out by pouring the liquid air through an ordinary paper filter.

In a demonstration recently, the apparatus used was of the laboratory character, and the proof of the effect was made by exposing a burning bunch of tow to the end of the pipe whence oxygen was expected to flow, where the combustion was made more intense, while at the end of the other pipe the neutral nitrogen diminished or extinguished the flame.

In the commercial machine, it is promised that with an expenditure of 500 horse-power the daily output will be 500,000 cubic feet of oxygen, ranging from 50 to 90 per cent in purity, and 1,000,000 cubic feet or more

of nitrogen of similar quality. In addition it is promised that 1,500 pounds of liquid carbonic acid will be produced.

The two products for which a direct commercial use are expected to be found are the oxygen and the liquid carbonic acid gas. The latter already has a fixed place in the market and large quantities of it are saved in well-equipped breweries where it is produced in great bulk through the fermenting of the beer. It is pumped into steel tubes under a pressure that liquefies it. It is worth about seven and one-half cents a pound.

The great market which Prof. Pictet expects to find for the oxygen is to support combustion at high temperatures in furnaces where coal is burned, making such fires available for purposes which only the electric arc is now suitable for as well as making a great economy in producing heat for ordinary purposes. In burning fuel with the oxygen of the air there must be admitted to the furnace about three times the bulk of oxygen or nitrogen, and this absorbs a large quantity of the heat. If an excess of air goes into the furnace, this also takes up and wastes heat. By admitting oxygen these losses can be saved. This saving, Prof. Pictet thinks, would equal 40 per cent of the present fuel bill.

It is proposed to put the oxygen in tubes or tank cars and ship it to consumers. Of the theoretical value of it there can be no doubt. The commercial feature remains to be demonstrated. The nitrogen, it is asserted, can be used for the production of nitric acid and Prof. Pictet says that by a process of his invention he can combine it into ammonia directly by exposing hydrogen and nitrogen to the electric arc under certain conditions. If this be true, Prof. Pictet has solved a problem of wonderful value which has defied the researches of the ablest chemists of the world.

## HORSEFLESH IN AMERICA.

Certain butchers in San Francisco have been detected in using horseflesh as a substitute for beef in sausages, Hamburg steaks, etc., owing to the cheapness of the equine flesh. The local Board of Health carefully investigated samples and has brought the offenders to justice. The flesh of horses selected with proper care and killed under proper conditions is by no means an unwholesome article of diet, says The New York Medical Journal, but there is no excuse for foisting it under false pretences upon customers in place of more expensive beef and other meats. If intended to be used as a food it should be sold openly, so that those who partake of it may know exactly what they are to consume and get the benefit of the difference in price.

In France, Germany, Austria, Belgium and other countries there are hippie butchers who make a specialty of this food, and, as is well known in Paris, the sale of horseflesh is very considerable. The butchers, however, are licensed, and the animals are slaughtered with as much attention to sanitation as are bees. Fortunately, it is very easy to detect the presence of horse meat even in as small percentages as five per cent. Twenty grammes of sausage finely minced are boiled from a half hour to an hour in 100 cubic centimeters of water. The volume of water is then reduced by evaporation to thirty cubic centimeters, then the liquid is cooled and filtered. About ten cubic centimeters are tested with a few drops of compound iodine solution (one part of iodine and twelve parts of potassium iodide in 100 parts of water). A fugitive reddish violet coloration indicates the presence of horse meat. The re-agent must be added carefully, so that no excess is added, as this is apt to change the color to a reddish-brown. It is probable, as our medical contemporary hints, that a little investigation in various cities will bring to light the mysterious hidden ways of the sausage vender.

## THE BEET SUGAR INDUSTRY.

Two-thirds of the world's sugar is now produced from beets. Prior to 1871-72 the world's production of beet sugar had reached a million tons; in the present crop year it is, according to latest estimates 5,510,000 tons, while the cane sugar crop which in 1871-72 was 1,599,000 tons is in the present year 2,904,000 tons. Thus cane sugar production has scarcely doubled during the period under consideration, while that from beets has more than quintupled. Meantime the price has fallen more than one-half, the average cost in foreign countries of all sugar imported into the United States in the fiscal year of 1872 being 5.37 cents per pound, and in 1899 2.39 cents per pound. These facts are interesting in view of the consideration of matters by Congress relating to the sugar-producing islands which have recently come into closer relations with the United States.

The sugar-producing area of the world has in less than half a century been shifted from the tropics northward and the farmer of the temperate zone has shown his ability not only to compete with the low-priced labor of the tropics, but in doing so to reduce by one-half the cost of the article produced.