

ing point on land, in small heaps, covered with tarpaulins. Six months ago some of the submerged coal was raised and burnt, in conjunction with a similar quantity of that which had been kept on land, and the results showed that the submerged coal had greater calorific qualities. Owing to the success of this test, further experiments are to be carried out on the same basis.

"AMERICAN ESTATES AND GARDENS."

Time was, and not so very long ago, when the attempt to produce a work of high quality devoted to American estates and gardens would have been foredoomed to failure for lack of material. A few planters' homes in the South, some fine old Colonial homes in Virginia, a few good Colonial houses in New England, and some scattered dwellings of the older families in the various seaboard States, the latter owing their interest more to historical than architectural considerations—this would have been the unfruitful field from which the materials for the work must have been gathered.

It was otherwise when the historian and the artist joined hands in the production of the lovely volumes on the stately homes of England which have appeared in profusion during the past few years, and are valued not less in America than in the country they portray. There the authors found ready to hand a wealth of material, the product of centuries of growth, and presenting a bewildering variety of architectural style, most of it infinitely grand and beautiful, and all of it enriched with that charm which only the hand of Time can impart.

At the same time the rapid growth in wealth and possessions of the American people during the past quarter of a century has given them the opportunity to express in larger degree that home instinct which is one of the strongest of our national traits; and the result is seen in the rapid growth among us of the house of importance, the stately home which by virtue of its size, dignity, and spacious surroundings is entitled to rank with the historic houses of the older countries. How rapid has been this development, how numerous and truly magnificent are the great houses and estates of America, is but little understood. It is in the belief that the time is ripe for giving this subject systematic and adequate treatment that we have published a work, "American Estates and Gardens," in which for the first time full justice has been done to a neglected feature of our national growth.

In the three hundred and forty pages and two hundred and seventy-five illustrations of this work, will be found portrayed and described practically every notable home and estate in the country; and it includes many lovely and unique places, whose beauties have never before been illustrated, the exterior and interior views being made by special permission for the present work.

In choosing the subjects for illustration, an effort has been made to include as great a variety as possible of styles, and show how admirably some of the foreign methods have been adapted to local climatic and domestic conditions, especially as affected by country life. The list of subjects includes the mansions of New York, Philadelphia, Boston and other leading cities; the "palaces" of Newport; the splendid seaside residences of the Sound, Long Island, and Palm Beach; the great interior landed estates and mansions to be found from Maine to Florida and as far west as California; while in size the houses illustrated range from the stately "Biltmore" to the snug hunting lodge in the Adirondacks or the tasteful studio where the artist makes his summer home.

The work is rich in interior views—a feature which will render it particularly valuable to those who are contemplating the erection of similar homes; for it is freely illustrative of the latest ideas in furnishing and decoration. Moreover, the American of wealth and leisure is an industrious traveler, and many of the owners of these homes are enthusiastic and discriminating collectors of objects of art. This feature has been borne in mind by the illustrator, and interior views have been selected, as far as possible, which included many of the choicest of these art collections.

A great house, like a rare gem, calls for appropriate setting; and much of the beauty of our American homes is due to the great care with which they have been placed with regard to their landscape surroundings, and to the lovely gardens which flank or front them. The work of the landscape gardener in many of the great homes rivals that of the architects, and throughout this superb volume, the garden views will be found to be one of the most attractive features.

Both the letter-press and the engravings (many of the latter in duotone) are samples of the very best work that can be done in the present state of the art, and the whole is printed on heavy plate paper. As this is the standard work on notable estates and gardens in America, and must remain so for many years to come, it should be in the library of every lover of domestic art and architecture.

THE NEW BRITISH PATENT ACT.

Several months ago the British Patent Act was amended and, among other changes in the practice, provision was made for the examination of patent applications to ascertain the novelty of inventions which are made the subjects of applications for patents. Hitherto there has been no examination in the British Patent Office as to the novelty of inventions, the result being that many invalid patents were granted in Great Britain. The knowledge of this law led many irresponsible attorneys, for the fees received, to encourage inventors to file applications for British patents, the grant of which there was no hope of sustaining in the courts. In fact, so many invalid patents were granted by the British Patent Office that every patent in Great Britain was looked at with suspicion, and the uncertainty concerning the validity of the best patents was seldom, in even a measure, cleared away except after laborious and expensive examinations made by solicitors, the public at large not being convinced that the patent, in fact as well as in name, created a monopoly until the patentee successfully contested the question in the courts. This very unsatisfactory condition led to the change in the law, the operation of which, however, was delayed until a trained corps of examiners could be secured to make the examinations and room could be provided in which they might work. Arrangements having now been completed, January 1, 1905, has been set as the time when the new provisions of the law will go into operation.

The examination will not in Great Britain, as in the patent offices of many other countries, attempt to include within its scope all that has been done throughout the industrial world, for it is provided in the new law that the examination will only include British patents, the applications for which were filed within fifty years immediately preceding the filing of the application which is being examined. As the knowledge of an invention outside of Great Britain will not in itself prevent the grant of a valid British patent, the examination in effect is much more complete than would at first appear, and the result will be to add materially to the commercial value of patents and patented inventions.

United States, German, and other inventors in whose home countries thorough examinations are made by the patent offices, will especially benefit by the new law, for they seldom file their applications in Great Britain until, by the actions of the examiners in the home patent office, they know the invention is novel, and they will therefore be able to obtain under the new law the same grant which they might have obtained under the old law, but with the additional value given by the examination. The patent granted under the new law, while substantially the same as that granted under the old provisions, will therefore receive public respect, which under the old provisions was often delayed until after much litigation.

The Patent Office is not authorized to refuse a patent because of lack of novelty, the decision of that question still remaining with the courts, but when an applicant refuses to amend an application to overcome what the examiners believe to be a pertinent reference, the Patent Office is authorized to print the number and date of the reference on the printed copy of the specification, to inform the public where the reference can be found and that certain features of the invention are believed to be anticipated by the examiners in the Patent Office.

The fees under the new law have been increased, but applicants will receive a most satisfactory return for the slight increase in the cost of the British patent.

TO OUR SUBSCRIBERS.

We are nearing the last issue of the year—the fifty-ninth of the SCIENTIFIC AMERICAN'S life. Since the subscription of many a subscriber will soon expire, it will not be amiss to call attention to the fact that the sending of the paper will be discontinued if the subscription be not renewed. In order to avoid any interruption in the receipt of the paper, subscriptions should be renewed before the publication of the first issue of the new year. To those who are not familiar with the SUPPLEMENT a word may not be out of place. The SUPPLEMENT contains articles too long for insertion in the SCIENTIFIC AMERICAN, as well as translations from foreign periodicals, the information contained in which would otherwise be inaccessible. By taking the SCIENTIFIC AMERICAN and SUPPLEMENT the subscriber receives the benefit of a reduction in the subscription price.

A new electric furnace method has been invented by M. A. Nodon. The electro-negative metal is fused and used as the cathode in an electric furnace with a non-attackable substance as anode and an electrolyte of a fusible, only slightly volatile, halogen compound of the more electro-positive metal. When a current is passed through, the ionization effected produces a combination of the metals, with liberation of the halogen.

SCIENCE NOTES.

Is it possible to express the pleasantness or unpleasantness of a climate on a scientific scale? asks Knowledge. Capt. W. F. Tyler, F.R.Met.Soc., has attempted to form such a scale. Concluding that the two dominant factors influencing our sensation of comfort are temperature and humidity, he has coined the word "hyther"—apparently from the first syllables of "hygrometer" and "thermometer"—to indicate this joint effect. A perfectly pleasant day is registered 0 on this hyther scale, and an intolerably oppressive one as 10. Capt. Tyler's own observations of "hyther" extend over several years, but in the end of the summer of 1902, he was able to get the co-operation of eleven other observers for the systematic observation of "hyther" throughout the month of August. The results of the comparison showed that most persons would require a considerable amount of practice before their observations could be considered trustworthy, but some approach was made toward the establishment of a definite law connecting the temperature and humidity with the hyther sensation. At the same time there were indications that some other factors, possibly barometric pressure or electric conditions, had an appreciable influence upon the sensation. The subject seems well worth working out on a more extended scale.

When an alkaline solution of gold is treated with different reducing agents, a strongly colored blue or red liquid is obtained which is supposed to contain the gold in a colloidal state. M. Hanriot, of Paris, took up a series of researches upon this question. He had previously shown that the different varieties of colloidal silver formed as many chemically distinct species having different properties, and wished to see whether gold did not act in the same way. Under the name of colloidal gold, Heinrich describes solutions which he obtained by treating chloride of gold with different reducing phenols such as pyrocatechine and hydrochinon. M. Hanriot formed a solution of colloidal gold by dissolving one gramme of chloride of gold in one liter of distilled water. This he boiled with enough carbonate of soda to give a slightly alkaline reaction. He then poured in a 1.1 per cent cold solution of pyrocatechine to the amount of 300 cubic centimeters. This formed a red color which soon changed to violet. Dilute sulphuric acid was added drop by drop until the solution became slightly acid. The liquid turns blue in this case and deposits a blue precipitate at the end of a certain time. After washing, the powder is dissolved in dilute ammonia and again precipitated by sulphuric acid, avoiding excess of the latter. This compound is a violet-blue powder which is very slightly soluble in pure water, but is insoluble in a slight excess of sulphuric or nitric acid or their alkaline salts. On the contrary it dissolves easily in alkalis, especially ammonia or carbonate of soda. The excess of ammonia can be expelled from such solution by boiling, but this does not throw down the gold. Strong acids, however, will cause a precipitate in this case. The latter precipitate is found to be hydrated, and water forms part of its constitution. Thus, when dried at 100 deg. C., it loses its solubility in alkalis. The analysis of the body, dried at 40 deg. C., is as follows: Water (which is expelled at 100 deg.) 2.04 parts; loss at red heat, 6.31; gold, 91.53; SO₃, 0.39. This compound is but little altered by acids. In alkaline solution it soon deposits metallic gold, while the liquid takes a brown color. It seems to contain an organic matter which is not easy to determine. Colloidal gold is not soluble in mercury. When calcined it gives off carbon monoxide and dioxide gases, and hydrogen. A point to be observed is that this body is precipitated from a solution by acids and in this state is insoluble, but is re-dissolved by adding an alkali. It is therefore not to be admitted that the solutions are formed of fine particles of gold which are not agglomerated, seeing that this body keeps its solubility even when in the solid state, as above shown. Besides, it shows acid properties and forms a series of salts with the heavy metals which are either soluble or insoluble, each having individual properties.

The retirement of William K. Jenne, of Wyckoff, Seamans & Benedict, was marked by a complimentary dinner given to him at the Waldorf-Astoria, Monday, November 28, and the tendering of a loving cup.

To Mr. Jenne, more than any one else, is the development of the modern typewriter due. It was in 1873 that the first crude model of the typewriter was taken to the gun works of E. Remington & Sons at Ilion. The development of the invention was placed in charge of Mr. Jenne. In Mr. Jenne's charge, it ever since remained. Through his labors the machine has steadily advanced through all the successive stages of improvement, from the first crude ideas of the inventors to the Remington models of the present day. During this time Mr. Jenne has not only seen the development of the typewriter, to which he devoted the labors of his life, but has also witnessed its progress from an absolutely untried experiment to the necessity it has now become in the world's work.