the flesh of these animals, in the encysted condition but still alive. If such meat is eaten without cooking thoroughly, the parasite is taken into the body and is rapidly propagated. The worm came originally from the rat. As hogs eat rats, they pass into the hog and thence into man. The only preventive is thorough cooking. This kills the trichinæ. No rare or underdone pork should ever be eaten. The risk is too great. The cost of immunity is so little, that anyone may be safe. Cook all pork thoroughly. 2. The cause of ptomaine poisoning by eating pork. What causes the presence of the poison, how the poison can be prevented, and whether or not there is any way of detecting the presence of poison before using the meat? A. Ptomaines are formed by decomposition. If only fresh food is used, one will be safe from these poisons.

(11062) H. S. N. asks: I have been a reader of your paper for several years, and always enjoy reading it. I should like to submit a problem for solution. The problem is this: Several years ago I took a picture of a fast train while running, a Michigan Central flier, at a point about two miles east of Decatur. On development the plate showed a blur of 1-32 inch, i.e., the pilot did. I used a Vive extra rapid plate; the focus of the lens was 6 inches; the distance of the engine, the pilot, from the camera, 50 feet; the length of exposure, 1-100 of one second; camera was placed at an angle of 15 deg. with the track. What was the speed of the train? The camera was a Vive, 4¼x4¼, meniscus lens. A. The solution of your problem of the speed of the train is not difficult, at least so far as a sufficiently close approximation is concerned. Start with the fact that the image of the pilot moved 1-32 inch during exposure. Since the lens is 6-inch focus and the pilot is 50 feet away, the pilot moved across the line drawn through the center of the lens, 100 times 1-32 inch, or 3.125 inches, since 50 feet is 100 times 6 inches. And since the camera made an angle of 15 deg. with the track, we must divide the 3.125 inches by the sine of 15 deg. to find the distance the pilot moved during the exposure. This gives 12.07 inches as the distance the train moved in the time of exposure, or 1-100 second. In one second it moved 1,207 inches, or 100 feet 7 inches. This is a speed of somewhat over 71 miles per hour. As we said above, this is an approximate solution, but still not far from the result which an exact solution would give.

(11063) J. S. N. asks: Will you kindly answer in your column of Notes and Queries the inclosed questions relative to Roman computation? I suppose the matter is simple enough, but I have never come across any work explaining it, nor any person whom I have asked who could throw any light on the subject. A. Very little is known concerning the method by which the Romans used their very inconvenient notation for performing the ordinary calculations. They are supposed to have used the abacus for all except the most simple problems. This instrument is in common use now by all Chinamen, and it is not difficult for any one to see it used wherever these men may be found. A description of the abacus may be had from any encyclopedia. There was a rod for each denomination of numbers to millions, seven rods each carrying five balls. Another set of short rods corresponded to these, and had one ball sliding on each. They could thus count by fives and carry by tens. Other rods supplied their need for calculating ounces. Further than this their business did not require them to go; they never needed to divide the distance of the sun by the velocity of light. They died in total darkness in regard to both of these data of the universe. As we said at the outset, we do not know the detail of the method by which the Romans made their calculations. Their mode of writing numbers was not like ours by placing like denominations in the same column, but each letter had its significance, and each number could be added by itself on the abacus, since each rod meant a denomination.

(11064) W. D. W. says: Will you be kind enough to answer the following questions for one who is anxious to know and who has the greatest respect for your opinion on scientific matters? 1. Will electric wires, furnishing current for arc lights coming in contact with street trees, injure them, that is, when the insulating covering has worn off from rubbing against the branches of the tree? One of the tree and park commission of this city (Columbia, S. C.), a college professor and a very intelligent gentleman, insists that the electricity, that is, all that is taken by the tree in wet weather, will do no harm, while I hold to the opinion that it will ultimately kill it, and I wish to know which one of us is wrong. A. We have found by experience that leakage from electric arc light wires does injure the limbs of trees, particularly when the difference of potential is very great, although we do not believe it would kill the tree unless it was very young. 2. When a tree has been killed by escaping electricity, how long a time should elapse, in case the leak be located and stopped, before it will be safe to put another tree in its place? A. We see no reason why another tree cannot be put in at once if the ground has been removed. 3. Some very large oaks that are exposed to the smoke from the railroad workshops have died very recently, and I am anxious to know if the smoke is responsible for their dying. The shops have been there for a long time, and it seems that if the smoke is the sole cause the trees ought to have died long before this time. It may be possible, however, that loss of vitality on account of age may be partly responsible for their dying. A. If the trees are very close to the top of the smoke-stacks, we have no doubt that the trees have lost some vitality on account of it, as the products of combustion are very destructive to vegetable life, but the trees would have to be under the direct influence of the smoke.

(11065) C. D. asks: 1. What point below the freezing point do air, hydrogen, nitrogen, oxygen, become liquid? A. These temperature points are very nearly as follows in Fahr. degrees, below zero: Air, 312; hydrogen, 422; nitrogen, 317; oxygen, 297. 2. Please give me the address of a reliable company that sells chemicals and chemical apparatus. A. You had better deal with a firm in the city near your home than buy at a distance and pay transportation charges. Our advertising columns very often contain the advertisements of these dealers. We do not advertise dealers in the Notes and Queries column. 3. Where can I get some books on argon, helium, neon, krypton, and xenon, and give me the prices of them? A. We can send you many valuable papers on the rare gases of the atmosphere which have appeared in the Supplement. Among them are argon, Nos. 1000, 1001, 1002, and others, price ten cents each; helium, Nos. 1056, 1057, price ten cents each. 4. What kind of chemical books, as organic chemistry, etc., so I can find liquid formene? What is formene? A. Formene is a tetrachloride of carbon CCl_4. Its preparation can be found in the Dispensatory. Its properties are those of an anæsthetic, similar to those of chloroform, soothing the pain of neuralgia and even causing insensibility. As it has been the cause of death also, it is not used by physicians. It is not a substance for an amateur to meddle with. 5. What are the uses of liquid air? A. At present liqud air is not put to any commercial use.

NEW BOOKS, ETC.

Animal Romances. By Graham Renshaw, M.B., F.Z.S. London: Sherratt & Hughes Co., 1908. 8vo.; 204 pp. Price, $3.

The book is illustrated by a number of most interesting half-tones showing some interesting beasts of Africa. One view of giraffes is most entertaining. The author has written a number of books on natural history and the present volume is a worthy successor to "Natural History Essays," "More Natural History Essays," "Final Natural History Essays."

Documentary Source Book of American History. 1606-1898. Edited with notes by William Macdonald. New York: The Macmillan Company, 1908. 12mo.; 116 pp. Price, $1.75.

The present volume has been prepared in response to a request frequently made by teachers who have used the author's "Select Charters," "Select Documents," and "Select Statutes," particularly designed for the course of instruction of an elementary or comprehensive character, all of which covers the colonial and the constitutional periods of American history in a single year. The book is filled with vitally important documents dealing with American history, such as the Navigation Act, the charters of various States, the Treaty of Paris, the Sugar Act, the Declaration of Independence, the Missouri Compromise, the Kansas-Nebraska Act, the Dred Scott Decision, the Civil Service Act. In all, there are 187 documents.

The Gardens of England in the Midland and Eastern Counties. Edited by Charles Holme. London and New York: John Lane Company, 1908. 4to.; 136 plates, 8 in color. Price, $3.50, postage 35 cents.

The publications of "The Studio" are noted for their sumptuousness, and the present volume is no disappointment. The illustrations are beautifully chosen and finely executed, the color plates being very remarkable productions. They are reproductions of water colors. The stately homes of England offer a never-failing field for the artist photographer. The text, which occupies some thirty-seven pages, is excellent.

Air Liquide, Oxygene, Azote. Par Georges Claude, lauréat de l'Institut. Préface de M. d'Arsonval, membre de l'Institut. Paris: H. Dunod et E. Pinat, 1908. 8vo.; 400 pages, 149 figures. Price, $3.00.

This work comprises within its scope all the phases of its subject. It is divided into four parts. The first is devoted to the principles of the liquefaction of gases, with the history of the early experiments. The second part is upon the industrial liquefaction of the air, with the necessary discussion of the principles involved and the demonstration of the results which can be expected. The completeness of the work may be seen in the fact that it includes the American machine of J. F. Place, which was introduced to the public in the spring of 1908. The third part contains the many curious experiments which illustrate the wonderful phenomena of the realm of the absolute zero. The last part is devoted to that most important topic, the separation from each other of the gases of the air. It is in this part that the highest practical interest is centered, since it has become probable that liquid air will find its chief commercial value as a source of pure oxygen and nitrogen for manufacturing purposes, and not as a source of power or as a refrigerating agent. To all the departments of its subject the book is a valuable contribution.

The Coming Science. By Hereward Carrington. With an Introduction by James H. Hyslop, Ph.D., LL.D. Boston: Small, Maynard & Co., 1908. 16mo.; 393 pages. Price, $1.50.

In presenting this work to the public the author must not be understood as indorsing or even as accepting all the views and theories that are advanced from time to time throughout the book. He offers these tentatively and merely as possible explanations for facts that, on the strength of existing testimony, he has assumed to be established. There are eighteen chapters, among which are "The Problems of Hypnotism"; "The Problems of Telepathy"; "The Problem of Sleep and Dreams"; "Modern Spiritualism"; "The Case of Mrs. Piper"; "The Nature of Apparitions"; "Experiments in Weighing the Soul"; "Premonitions." The book is arousing considerable attention.

INDEX OF INVENTIONS

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AND EACH BEARING THAT DATE

[See note at end of list about copies of these patents.]

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Lever, F. T. Gracey 907,036
safe a a . Farnsworth..... 907,021
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Liquid vending device, H. Pein 906,554
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Locomotive boiler washing and filling system, W. White, reissue 12,898
Loom filling detecting mechanism, Bounds & Burton 906,683
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F. Crooke 906,777
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Nut lock, Martien & Small..... 906,728
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g er f tatf:: e rin r : i . Nodacker 906,781
Ore separator, J. G. Kirksey..... 906,735
Ores, desulphuring, R. Hubner..... 906,817
Oscillation detector, C. D. Babcock..... 936,535
Oven, V. V. Bolls 906,883
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Overalls or other like garments, antislipping protector for, B. Hestness 907,102
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COMPLETE LISTS of manufacturers in all lines supplied at short notice at moderate rates. Small and special lists compiled to order at various prices. Estimates should be obtained in advance. Address Munn & Co., List Department, Box 773, New York.

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Tube heading machine, H. C. Hunter	906,885
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Water gage, W. Nelson	906,736
Water wheel, A. Tschirgi	906,754
Weather strip, F. R. Vordermark	906,756
Weighing machine, coin controlled, F. Verplast	906,755
Weighing machine or weigh bridge, automatic indicator, H. Pooley	906,657
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Wheel elastic tire, Umlauf & Bohm	906,834
Wheel tire, elastic, C. King	906,805
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Cigars, A. Sendelbach	71,821
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