was elected vice-president and chairman of Section E, American Association for the Advancement of Science, and Dr. George B. Shattuck was elected secretary.

SOME CURIOUS AUSTRALIAN CAVES.

By JOHN PLUMMER.

AMONG the numerous minor cave systems found in New South Wales, none are more remarkable than those situated at Oakey Creek, in the heart of a country rich in mineral wealth, gold, silver, and tin being frequently found, also diamonds and other gemstones. All the streams in the neighborhood are more or less auriferous, and some of the oldest and richest goldfields in the State are to be found within a radius of a few miles. The caves are situated about a couple of miles from Cudjiegong, a small but thriving rural village, surrounded by well-cultivated farms. The mineral richness of the district is proverbial, the whole of the country to the west being an immense goldfield, of which Hargraves, Windeyer and Tambaroora are the leading centers; while southward are Sofala, Hill End, Ophir, and other well-known gold-mining localities. Between Cudjiegong and Rylstoe are some valuable cinnabar deposits. Copper, antimony and sulphur ores have been found at Oakey Creek, and large quantities of alum at Bocoble Creek, so called from Mount Bocoble, a remarkably shaped peak, forming one of the principal landmarks in the district. The Cudjiegong River, on which the township is situated, is an auriferous stream, rising in Mount Benben, a peak of the Australian Alps, the country through which it flows being highly picturesque in places. The entrance to the caves is situated in a sequestered nook, and might be unsuspectingly passed by anyone not aware of its real character. How it was discovered has never been explained, but the first explorer must have been possessed of considerable nerve, for the opening is very small, only large enough to enable a moderately-sized person to crawl through, and when the visitor has safely accomplished this feat, he finds himself encircled by Cimmerian darkness. But directly a candle is lighted a wonderful transformation takes place, and a most enchanting scene, formed by multitudes of dainty, fantastically-shaped stalactites and stalagmites becomes revealed to view. The floor is one vast deposit of carbonate of lime, and from the roofs and sides of the calcareous cavity the same mineral hangs pendant in strange conglomerate shapes, that are sometimes artistic and sometimes grotesque. The visitor, unless forewarned, has not time enough to take in the beauties of these natural curiosities before he experiences a revulsion of horror at what is likely to make his flesh creep and his hair stand on end with apprehension of peril. No sooner does the light dispel the darkness than he is made aware of the presence of scores of bats, whose whirring flight is likely to make the unsophisticated conjure up ideas of hobgoblins and other denizens of spirit-land. Right at the entrance, too, is a solid white block, which has been formed from the constant drip of the limestone, and which, from its supernatural appearance and resemblance to the human form, has been christened "The Ghost." In this large cave there are four or five chambers, all similarly formed. In the main eastern one a dwarf fissure communicates with the upper crust, or *terra firma*, through which a tiny stream of light issues, which only serves to make the intense darkness a greater source of apprehension. The large cave leads to another, known as "The Blow Hole," the mysteries of which have never been penetrated. The entrance is by a crevice equal in size to the outer opening to the caves, but on throwing a stone in some seconds elapse before it is heard to strike bottom, a sufficient admonition to even the most venturesome of the abyss within, to explore which would be literally walking into the jaws of death. Those most familiar with the caves express an opinion that if the Blow Hole were properly explored another series of subterranean passages or chambers would be discovered. At present the caves are seldom visited, their existence being known to comparatively few outside the locality in which they are situated.

AUSTRALIAN SOFT WOODS.

THE heavy timbers in which Australia is so rich have become famous for their exceptional hardness and durability, but comparatively little is known outside the commonwealth of the numerous soft woods admirably adapted for the manufacture of furniture and for other industrial purposes. Such timbers are abundant in New South Wales, and are found principally in the immense brush forests of the coastal districts. Several of these timbers have a wood grained and marked most beautifully, and capable of receiving the highest polish, while others are fragrantly perfumed. Among the chief varieties of woods of this class may be mentioned the red cedar, the beautiful wood of which is admirably adapted for the finer kinds of cabinetmakers' work. Some of the cedar trees grow to an immense size, as much as 2,500 cubic feet of valuable timber having been obtained from one tree. In addition to the cedar may be mentioned tulipwood, yellowwood, white maple, myall, marblewood, mock orange, and many others. Besides their use for cabinetmaking, many of the brush timbers are of great utility for the rougher kinds of carpentry, while some, both hard and soft woods, are admirably adapted for coach builders' and coopers' work. The chief description of pine growing in New South Wales is the Moreton Bay white pine, found in the coast districts, as far south as the Bellinger. It is soft, light, and easily wrought, and suitable for all the interior woodwork of houses, as well as for cabinetmaking. The red or black pine is extensively distributed over the Liverpool Plains, and in the Lachlan and Darling River districts, as well as around Berrima. It is beautifully marked in the grain, takes a fine polish, and has an agreeable fragrance. There are numerous other varieties of pine, but these resemble in their main features the trees already described. Australian deal is an excellent timber, and is obtained in very large scantling, the tree frequently reaching 120 feet in height. It is soft, close-grained, easily wrought, and remarkably free from knots. Its use, therefore, is extensive for cabinetmakers' work

and house fittings. The New South Wales Government Statistician mentions several of the more useful of the soft and fancy woods of the State. They include the beech, which attains a height of 100 to 150 feet, with a diameter of 3 to 5 feet, giving a strong, white, close-grained, and durable wood, easily worked, and greatly valued for decks of vessels, flooring, turnery and furniture making; the black bean, growing to a height of 120 to 130 feet, with a diameter of from 4 to 5 feet, with a handsome, close-grained, dark-colored, durable wood; the black oak, used for bullock yokes, tool handles, shingles, etc.; and the blackwood, resembling walnut, and highly valued for making furniture. Another valuable timber is the rosewood. It is strong-grained and durable, with a color resembling Spanish mahogany. Among other woods may be mentioned the silky oak, which attains a height of 70 to 80 feet. The color is a light gray, beautifully crossed with silvery waves, and when polished the surface has a delicate luster. Bedroom suits made from this wood possess a dainty appearance. Satinwood is another useful timber, yellow in color. It is soft and silky to the touch, close-grained, and easily wrought. This wood is also suitable for cabinetmaking, and is considered to be superior to the satinwood used in the European and American furniture trade. When the system of forest conservation becomes more general in the State, the supplies of many of the timbers mentioned will become practically inexhaustible, and are certain to be in large demand for export purposes.

TRADE SUGGESTIONS FROM UNITED STATES CONSULS.

Advice to Exporters to Scotland.—In a letter to the Philadelphia Museums (the original has been forwarded) Consul Rufus Fleming, of Edinburgh, gives the following information:

Commercial Travelers.—The question of chief importance to our manufacturers is how to introduce or extend the sale of a special article or special line of articles—whether to place it wholly in the hands of local agents or to send men to work up trade. The difference between American and Scottish business methods is a matter of common knowledge to all our exporters; it is a difference of temperament and of customs. We are in the habit of "pushing trade," and are not satisfied with slow returns. If I were asked whether, in my opinion, an American is a better seller of American goods in Scotland than a Scotsman, I should answer in the affirmative, but with the qualification that the American salesman must have the tact to adapt himself rigidly to the business ways and social customs of the country. Enterprise counts, if wisely directed, and if there is back of it a good-humored patience and a thorough respect for the ideas and methods of the commercial community in Scotland. The foreign salesman who becomes a critic is a failure. He can sell nothing. I had a talk on this subject recently with an American agent of an American manufacturing concern who has had more than a year's experience in England and Scotland, and, I may add, has been very successful during the past six months. He said:

"My company entered this field about two years ago, establishing a general agency in London with an American in charge, and sending across a dozen salesmen, some of whom had done excellent work in our country as commercial travelers. Only three of these men were here at the end of the year. Nine had not earned their salt, and were recalled. The trouble was with the men—not with the machine which they were introducing. None of us had been in Great Britain before and we knew little about business customs on this side, and less in regard to the characteristics of the people. During the first three months, I frankly confess, I pursued a foolish course. I had adopted the wrong attitude at the start in assuming that I knew better than the merchants and shopkeepers what were their requirements and how to conduct their businesses. Finally, it dawned upon me that I was not here to change the commercial methods but to sell machines, and that the only way to do business was to accept conditions as they were and to get into harmony with them. From that day, I have been successful. All my early ideas about business men and methods in Scotland have undergone a radical change. Not only the wholesale merchants but also the shopkeepers are, as a rule, remarkably clear-headed men, with a perfect knowledge of their own affairs and interests; always ready to spend money in order to make money, and each relying absolutely upon his own judgment as to the merits of any article brought to his attention."

Within the limitations which I have indicated, the enterprise of American commercial travelers or agents and of those of the Continent, notably Germans and Russians, is effective. I need not go into details as to what methods are specially useful. They are the methods common in our country. For example, the American agent of a computing scale company began business in a Scotch city by going to all the principal grocers and butchers, making a purchase at each shop, taking a memorandum in each instance of the weight and cost. Afterward, when he invited them to come to his place of business and see the computing scale, the agent was able to show each exactly what he had lost in that small transaction. All legitimate plans of selling machines or goods can be as effectively applied here as in America or elsewhere, by one who fully understands the national or racial temperament.

Labor-Saving Machinery.—American manufacturers are aware of the hostility of British workmen to labor-saving machinery. Some of our makers of machinery have had experience of this antagonism in British shops to any new devices for increasing the output without increasing the labor cost, and they have learned to expect that their machines sold in England or Scotland must at first undergo a severe test at the hands of unfriendly operators. I have in mind the case of a Scotch sawmiller who purchased in America an improved device for one branch of his business, which was guaranteed to do one-third more work than the apparatus he had long been using, without any additional labor cost. For some weeks after the machine

was installed, there was no greater output. He questioned his workmen and watched them, but could discover no delinquency on their part. Confident, however, that they were not giving the machine a fair trial—he had seen it operate in America and knew what it would do under favorable conditions—he resolved to get at the difficulty, and, giving the men a holiday one Saturday, he went to the mill with his superintendent, and they operated the machine with far better results than had been obtained by the workmen—in a word, it did exactly what the makers had said it would do. On Monday morning, the sawmiller told his men that if they wished to continue in his employ they must turn out a certain amount of work per hour with the new machine. He had no reason thereafter to find fault with either the machine or the men. This incident is one of the many that might be related, showing that our manufacturers of labor-saving apparatus must always have in view, when selling to new customers on this side, the probability that their machines will not receive friendly or fair treatment from workmen at the start.

Notes.—On the general subject of the development of our trade here, I present a few observations, which are intended as suggestions:

1. Scotsmen have a decided preference for British-made goods, if equal in quality and not markedly higher in prices than foreign competing articles. To sell foreign competing goods in Scotland, it is necessary, as a rule, to offer a superior grade at the prevailing prices, or standard goods at prices below the quotations for the home articles. American goods are preferred to any other foreign products.

2. In the case of a novelty or a non-competing article greatly superior, price is a secondary consideration with the average Scotsman. If he wants it, he will buy it, provided the price is within reason.

3. In offering machinery of any kind here, it is a mistake to make extravagant claims as to what it will do. A moderate statement of its advantages is far more likely to lead to a sale.

4. Merchants and manufacturers wish to deal with a duly commissioned and responsible representative of the firm or company seeking to do business with them—an agent authorized to make a definite and binding contract.

5. In almost all lines of trade, c. i. f. quotations are required.

6. In every pound of promise a Scotsman expects to find sixteen ounces of performance.

Demand for American Machinery at Quito.—Under date of December 1, 1902, Minister Sampson, of Quito, writes that a company is being formed in that city to build a large cotton mill. The preference is for American machinery and looms, and the request is made that firms interested, particularly the Northrup Loom Company, send as soon as possible their catalogues and price lists to Minister Sampson, care of the State Department, Washington. European agents are already bidding for the contract, which will not be let until American catalogues and price lists have been received.

Opening for Sulphate of Copper in Greece.—I have just sent a telegram* announcing the decision of the Currant Bank to purchase sulphate of copper to the extent of 1,000 tons for immediate shipment.

The conditions governing bids are the same as those of last year, particulars of which were printed in Consular Reports No. 258 (March, 1902).† The bids will be opened January 22, and the successful company must place the cargo in this port on or before the 28th of February.

The success of the American syndicate last year—for the first time, I believe, in the copper-sulphate trade of this country when our product was brought into direct competition with the European—presupposes a favorable issue a second time. However, European firms which have succeeded for many seasons in placing their product on this market at high prices were enlightened, though not pleased, by the American invasion of last year, and their representatives here are prepared to nip this invasion in its infancy. The order which the Currant Bank expects to place has double the value of its last year's opening order, and is certainly worth three times last year's effort to secure.—Frank W. Jackson, Consul at Patras.

Cheap Household Disinfectant.—Fendler (Gazette des Hôpitaux) has recently recommended the following as a powerful and cheap domestic disinfectant, which may be employed with advantage instead of more costly proprietary preparations: Tar oil, 20; sulphuric acid (90 per cent), 30; water, q. s. Heat the tar oil with the acid and cautiously add sufficient water to produce 100 parts. The product is a brown liquid with a phenol odor, which mixes bright, or nearly so, with water, in all proportions.—Nat. Drug.

* Printed in Advance Sheets No. 1535 (December 20, 1902).
† Advance Sheets No. 1264.

INDEX TO ADVANCE SHEETS OF CONSULAR REPORTS.

- No. 1548. January 19.**—Metric Weights and Measures in Germany.
No. 1549. January 20.—Water Power in France—Repairing Aerial Wires by Automobile in France.
No. 1550. January 21.—Salt Mines of Iletzk, Russia—Textile Industry of St. Etienne—Silkworms in Italy—Siberian Copper—Dominican Customs Revenue—Leases of Rubber Land in Peru.
No. 1551. January 22.—Our Foreign Commerce in 1902.
No. 1552. January 23.—Railway Construction in Africa—*Opening for Sulphate of Copper in Greece—Preparation of Zacaton in Mexico—Meat Products in Paraguay—Russian Exhibition of Historical Attire—Exhibit of Photography at St. Petersburg.
No. 1553. January 24.—French Automobile Exposition—Amherstburg-Windsor Electric Road—Blockade of Venezuelan Ports.

The Reports marked with an asterisk (*) will be published in the SCIENTIFIC AMERICAN SUPPLEMENT. Interested parties can obtain the other Reports by application to Bureau of Foreign Commerce, Department of State, Washington, D. C., and we suggest immediate application before the supply is exhausted.