we can say in reply is, that this arises either from misapprehending what a science is, or from contemning the subject as unworthy of study. Science consists very largely in the establishment of exact relations between cause and effect, and a subject in which such a relation cannot be traced is unworthy of serious study as a science. In a word, if we admit that we can trace the relation of cause and effect, then we admit ourselves to be dealing with a science. If we do not admit this, then it is of no use to talk about questions of economic policy, and the safest course is to frown upon all social movements as productive of results which no man can foresee, and which are as likely to do harm as good.

The next question which arises is, how shall we proceed to acquire the necessary knowledge of society, — by purely deductive processes from general principles, or by the study of the facts as developed by history and statistics? I reply, we can attain no result except by a judicious combination of both processes. Some questions can be settled conclusively by common-sense deduction, while others are about matters of fact, and can be settled only by a study of facts. If a proposition were before the people of New York to withdraw water from the Croton Lake for industrial uses, and if the promoters of the scheme should publish an historical investigation of the phenomena of all aqueducts from the time of Caesar until now, to show that the withdrawal of the water would increase the available supply in New York, everybody would laugh at them. So in economics. No study of facts will tell us whether the number of houses available for a community will be increased or diminished by restricting the number of men who shall be allowed to learn the arts of carpentry and brick-laying, and by diminishing their hours of labor. But common sense settles the question at once.

If asked whether the most urgent want of the student is a knowledge of facts, or the practice of deduction and the study of deductive methods, I should reply that neither was urgent. What is really urgent is, that he shall know how to study facts effectively, and be able to understand principles rationally. The prevailing defect of the times is too much reliance on deduction, and too little understanding how to study the facts of the social organism, and how to apply principles to the study. What all economists should agree upon in their teaching, is to emphasize both the understanding of principles and the investigation of facts.

I have in my mind's eye two ideal men. The one has at his fingers' ends the state of commerce and trade the world over, knows the amount of imports and exports of all nations, and has their laws of banking and currency learned off by heart, but, with all this knowledge, does not understand the laws of supply and demand, nor see any reason why there should be a relation between the imports and exports of a country. The other ideal man has a clear understanding of the laws of supply and demand, and all other abstract principles of economics, but is absolutely ignorant of the actual condition of trade and commerce in any part of the world. Which man is better equipped to answer an economic question? I reply, that, taking them as they stand, neither is well equipped. But the second man has this advantage over the first, — that, when the question is presented to him, he will know how to investigate it, and, with the aid of better informed men, will be able to find out the essential facts for himself; while the other man will never be able to make any really valuable use of his knowledge. Hence I prefer a system of instruction which is more concerned in teaching the student how to think and investigate, than in storing his mind with facts.

Simon Newcomb.

GEOGRAPHICAL NOTES.

The Kongo. — The steam-launch Peace, belonging to the English missionaries on the Kongo, has been busily engaged, since her arrival on the river, in geographical work. Among the voyages made and reported by the Rev. G. Grenfell are a reconnaissance of the Kassai or Quango to longitude 17° 30′ East Greenwich. Another journey included a visit to the Lomami and Ikelemba, affluents of the left bank, and several others of the right bank, among them the Nkemfe, which proved narrow and tortuous. The Mobangi was navigable as far as explored; the Itimbiri also as far as the Lobi Falls, in 23° 28′ east longitude and 1° 50′ north latitude. At three or four miles from the junction of the Mbura with the Kongo, the former was found to divide into two branches, both barred by rapids or falls, the south branch having a cataract forty feet high. The Lomami is a fine river; but the current is very swift and the channel tortuous, so that the launch could make good but some six miles a day during the latter part of their stay upon it. In August of last year the Lulongo was ascended to a distance of nearly seven hundred miles. Its principal affluent is the Lopori, in 1° 12′ north latitude. Stanley's Black River, which enters the Kongo near the equator, is formed by the junction of the Juapa and Bosira. Hostile tribes forced the explorers to retreat after exploring the former some three hundred miles, when it was still navigable. The Bosira was only navigable for

about two-thirds that distance. Careful astronomical observations were made, and the final reduction of the many results obtained will greatly ameliorate the charts of the Kongo basin. The Rev. Mr. Grenfell insists upon the richness of the upper Kongo basin, and especially of the Kassai valley, and reiterates the opinion expressed by others, that a railway across the arid region of the lower Kongo is the only means by which commerce can be assured an entrance into this vast and fertile region.

Trade-route to Bolivia. — Information from Buenos Ayres indicates that Thouar departed thence for the upper river last February, and expected to reach Tarija early in April. He was to ascend the Pilcomayo with a Bolivian escort on a steamer of two hundred tons detailed for the purpose. It is hoped that the explorations now in progress will result in a permanent route for the commerce of eastern Bolivia toward the Atlantic. M. Thouar's health continued good, though fever was very prevalent: he attributes his exemption, at least in part, to the use of fumigations of sulphur.

Lake Moeris. — Mr. Cope Whitehouse, who has been investigating the supposed site of Lake Moeris in the Raian basin, writes, that, assisted by Herr Stadler, a government engineer, and his party, a line of levels has been run between the canal of Gharak, connecting with the Nile, and the margin of the depression. At a point twelve metres from the level of the Mediterranean a bench-mark was established, and a sketch of the whole basin made. The ruins of the Wadi Moelleh are supposed by Mr. Whitehouse to be those of Dionisian placed by Ptolemy on a long and narrow arm of Lake Moeris. Col. Scott Moncrieff, director of public works, will have made a general plan and estimates for a canal, to fill the basin from the Nile, as soon as the hot season is over. The Mussulmans regard the project favorably, as they have a tradition that Lake Moeris was established by the patriarch Joseph, the Bahr Jussuf still retaining his name. It would result from these works that at high Nile an area of six hundred square kilometres could be covered to a depth of eighty or ninety metres, capable of doubling the volume of the low Nile, and of rendering an immense extent of now desert ground susceptible of cultivation.

The spring in Alaska. — The spring in Alaska has been unusually late and cold, with exceptional precipitation. A large number of prospectors have crossed over the divide to the British head waters of the Yukon, in search of the rich diggings found by a lucky few last year. Many of them are doubtless doomed to severe disappointment. The fishing-fleet has already sailed from San Francisco, consisting of eleven vessels, of 2,331 tons, manned by 273 men. Four of the vessels fish in the Okhotsk Sea; the remainder, in Alaskan waters.

PARIS LETTER.

PROFESSOR DE LACAZE-DUTHIERS, whose name is familiar to all zoölogists, owing to many very good contributions to the biological sciences, has, after a rather severe illness which kept him confined to his room for more than three months, resumed his yearly task, and begun his lectures. As usual, his opening address was devoted to a general summing-up of what work has been done in his laboratory during the past year; but this time, instead of a short summary, he delivered a lengthy address concerning his seventeen-years' task as a professor of zoölogy in the Sorbonne.

M. de Lacaze-Duthiers was appointed in 1869. Professor Milne-Edwards being then professor of comparative anatomy, M. de Lacaze-Duthiers had to undertake the teaching of zoölogy proper; which he did, it must be said, with a great deal of talent and energy. He understood very well that zoölogy can be taught only in part, and that the greater part of that science the student must learn by himself alone, without tuition, by practice and experience under the direction of his teacher. In order to give students all possible aid, he undertook to found a marine biological station on the Brittany coast. With the aid of government, he began the laboratory of Roscoff in 1872, and thus accomplished a very useful work. I visited this laboratory some two or three years ago, and spent there a month or so in scientific pursuits. It is very well organized and directed.

Roscoff is a little town, or rather a big village, near Morlaix, where a few people come to spend the summer season, for sea-bathing, and where there is nothing to prevent a good time of hard work, since the only diversion to be had is work itself. The inmates of the laboratory, who are allowed to spend their time as they please, with Professor de Lacaze-Duthiers's consent, live in the laboratory itself. Each has his sleeping-room. Some work in their sleeping-rooms; others, in two or three big rooms fixed up for working purposes, and representing real zoölogical laboratories. A library and a parlor are for general use; an aquarium, with a number of tanks, contains the rare or curious species of the coast; there is also a collection of preserved specimens, which will be used some day to build up a fauna of the Roscoff coast.

Roscoff receives a good number of students who