in the parcels of potatoes of the variety Calvache. But although the malady has increased very rapidly and is abundant in the tomato plots, it has not flourished in those of the potato.

Where did this new parasite come from? We have not met with it up to the present on any of our wild Solanaceæ, so as to enable us to infer that it has been transferred from them to the potato and tomato; neither has seed been received from Costa Rica so we could believe that it has come from that locality. The trouble, as it has manifested itself, has appeared on plots grown from North American seed, in a way to make us think that this new plague is to be referred to the United States.

Mr. Pachano informs me by letter that the disease was not so prominent during 1919 as it was in 1918, but had the same relative predominance on the tomato, especially on the North American varieties. He has also modified his views regarding its origin. We may assume, I think, that the susceptibility of North American varieties has no special significance in connection with the question of the native host or habitat. The snapdragon rust has been known since 1897, and has spread throughout the United States, but only recently has it been traced to its native Californian hosts. In fact I think we can safely assume that the appearance of the potato rust in the gardens of central Ecuador indicates that the rust can be found on uncultivated native plants in that same region. The Solanum rusts of tropical and semi-tropical America are numerous, but have been little studied, and those of Ecuador almost not at all.

There is a rust described from Colombia on *Sarache edulis,* a close relative of Solanum, which much resembles the potato rust except that it has slightly larger spores. This same rust on another species of Sarache was found in the vicinity of potato rust on Mt. Irazú in Costa Rica by E. W. D. Holway, who tells me that the plant is common in gardens there, going by the name "yerba mora." There is also a very similar rust known on the wild *Solanum triquetrum,* a vine ranging southward from central Texas into the adjacent region of Mexico, but this form has slightly smaller spores than the potato rust. Only actual trial can show if these forms can be transferred from one host to another, and if the size of the spores is in anywise dependent upon the host.

A variation in spore-size apparently dependent on the host is found to occur in the case of the snapdragon rust, and cases of such size variation are known for other species, some of them authenticated by pedigree cultures. The spores from the potato and tomato are remarkably uniform in size. Whether the three forms of Solanaceous rusts here referred to are the same or not, it is fairly safe to predict that the potato rust has originated somewhere between Ecuador and Costa Rica on hosts native to the localities.

J. C. ARTHUR

PURDUE UNIVERSITY,
LAFAYETTE, INDIANA

SCIENTIFIC EVENTS

A WORLD ATLAS OF COMMERCIAL GEOLOGY

WITH the growth of American industries the known and the possible sources of our supplies of raw materials have become of greater and more pressing interest. Even the United States—most favored of nations in abundance and variety of raw materials—can not be self-sufficient; it must look beyond its shores for supplies as well as for markets. The study of the distribution of mineral raw materials and their relations to the promotion of trade and the control of industry is a branch of geology and may best be termed commercial geology. Under the complex requirements of present-day life no continent, not even North America, can be self-sustaining. It is no longer enough for us to make an inventory of the mineral wealth of the United States; we must supplement that inventory by a broad understanding of world demand and supply. To set forth graphically and to describe concisely the basic facts concerning both the present and the future sources of the useful minerals is the purpose of a World Atlas of Commercial Geology just

issued by the United States Geological Survey, Department of the Interior.

The output of the essential minerals in 1913, the latest normal year, may at least be regarded as a measure of the "quick assets" possessed by each nation, and the first part of the World Atlas of Commercial Geology has therefore been planned to show the distribution of mineral production in 1913.

The practical value of this exhibit of the world's mineral assets is evident. Experience gained during the World War emphasizes the advantage of an adequate supply of raw materials close at hand, yet that there are certain economic limits to domestic independence in raw materials is clearly shown by the readjustments already made. The more facts we possess bearing upon the relative quantity and the relative availability of the mineral resources of our own and of other countries, the better able will be our captains of industry to decide whence they should derive their raw material. The mines of the United States should be looked upon primarily as tributary to the many mills, shops, and factories in which the skilled labor of the country may find its opportunity for a livelihood. The output of raw minerals measures only the first step in industry.

More than a score of geologists have cooperated in the preparation of this atlas, which was first undertaken during the World War as a part of the task of keeping American industries supplied with raw material and is to be regarded therefore as a by-product of the war-time activities of the Geological Survey.

AWARDS OF THE LOUTREUIL FOUNDATION OF THE PARIS ACADEMY

Among the awards made this year, as we learn from the report in *Nature*, are the following:

(1) 10,000 francs to Charles Alluaud and to R. Jeannel, for the study of the zoological and botanical material collected by them in the high mountains of eastern Africa and for the publication of the results.

(2) 5,000 francs to Jules Baillaud, for the establishment of a recording microphotometer of the type suggested in 1912 by P. Koch.

(3) 3,000 francs to Henry Bourget, director of the Marseilles Observatory, for the *Journal des Observateurs*.

(4) 2,000 francs to Clément Codron, for his researches on the sawing of metals.

(5) 5,000 francs to the School of Anthropology, for the publication of the *Revue d'Anthropologie*.

(6) 4,000 francs to Justin Jolly, for the publication of a work on blood and hæmatoporesis.

(7) 7,000 francs to Louis Joubin, for the publication of the results of the French Antarctic Expedition.

(8) 3,000 francs to the late Jules Laurent, for the publication (under the direction of Gaston Bonnier) of a work on the flora and geography of the neighborhood of Rheims.

(9) 3,000 francs to Henri Brocard and Léon Lemoyne, for the publication of the second and third volumes of their work entitled "Courbes géométriques remarquables planes et gauches."

(10) 2,000 francs to A. Menegaux, for the *Revue française d'Ornithologie*.

(11) 5,000 francs to Charles Nordmann, for his researches on stellar photometry.

(12) 8,000 francs to the Zi-Ka-Wei Observatory, in China (director, R. P. Gauthier), for recording time-signals from distant centers.

(13) 2,000 francs to O. Parent, for his studies on a group of Diptera.

(14) 10,000 francs to G. Pruvot and G. Racovitza, directors of the *Archives de Zoologie expérimentale et générale*, for this publication.

(15) 6,000 francs to Alcide Railliet, for the publication of researches on the parasites of the domestic animals of Indo-China.

(16) 4,000 francs to J. J. Rey, for the publication of a botanical geography of the Central Pyrenees.

(17) 10,000 francs to Maximilien Ringelmann, for researches relating to the physical and mechanical constants of metals intended to be used in the construction of agricultural machines.

(18) 12,000 francs to the Academy of Sciences, for the establishment of a catalogue of scientific and technical periodicals in the libraries of Paris.

It was pointed out by the council in 1917, that, although the special object of this foundation was the promotion of original research, up to that time requests for assisting work to be carried out according to a well-defined scheme had been exceedingly few in number.