no desire to colonize other regions than those taken from Turkey.

The following tables are of much interest. They show that eighty per cent of the colonial territory held by Europe belongs to Great Britain, that over eighty per cent of the entire commerce is with Great Britain, while the territory of its colonies is sixty times as large as that of Great Britain itself.

Territory.

Countries.	Surface in square kilometres.			Per-centages.	
	Mother-country.	Colonies.	Total.	Moth. coun.	Col's.
England...	312,639	20,552,574	20,865,213	1.5	98.5
Portugal..	89,297	1,827,259	1,916,556	4.7	95.3
Netherl'ds.	32,745	1,767,748	1,800,493	1.8	98.2
France	528,393	990,825	1,519,218	34.8	65.2
Spain.....	499,570	429,085	928,655	53.3	46.2
Denmark..	35,686	225,564	261,250	13.7	86.3
Total....	1,498,330	25,793,055	27,291,385	5.5	94.5

Population.

Countries.	Population in 1881.			Per-centages.	
	Mother-country.	Colonies.	Total.	Moth. coun.	Col's.
England...	35,153,780	213,918,000	249,071,000	14.1	85.9
Netherl'ds.	4,172,991	26,841,597	31,014,588	13.5	86.5
France	37,672,048	8,722,857	46,394,905	81.2	18.9
Spain.....	16,350,874	8,175,467	24,526,341	66.7	33.3
Portugal...	4,160,315	3,723,967	7,884,282	52.8	47.2
Denmark..	1,969,045	127,122	2,096,167	91.8	8.2
Total....	99,479,053	261,509,010	360,988,063	27.6	72.4

Trade.

Countries.	Commerce of the mother-country.	Commerce of the colonies with the moth.-country.	Colonial commerce compared to the commerce of the mother-country in percentages.
England	17,884,275,000	4,658,950,000	26.00
France	10,636,500,000	526,400,000	4 95
Netherlands...	4,428,450,000	200,200,000	4.50
Spain....	1,371,150,000	128,800,000	9.39
Denmark.....	598,950 000	22,500,000	2.46
Portugal	391,950,000	7,925,000	2.02
Total.....	35,311,275,000	5,544,775,000	15.70

GARDINER G. HUBBARD.

THE U. S. GEOLOGICAL SURVEY.

AS a part of the evidence before the commission considering the organization of the government scientific bureaus, there was recently presented a letter from Mr. Alexander Agassiz, in which he took occasion to censure the work of the geological survey, and to condemn to some extent its existence as a government institution.

One question raised by Mr. Agassiz is whether the work carried on by the survey should not be left to individual enterprise. In answer to this, Major Powell, in a reply addressed to the commission, calls attention to the large expenditures required for such work, and adds, that he has no knowledge of any case where private institutions, such as colleges or societies, have undertaken to do field-work in topography and geology. To some extent individuals, notably a few college professors, have made geological excursions in the field, and have accumulated valuable material.

The principal publications in this country on geology and paleontology, however, have contained the results of investigations carried on at the expense of the general or state governments; and the publication of such results, on account of the cost of the plates required, is far beyond the resources of private institutions. To show the relation between the official publications and those at private expense, Major Powell presents some figures collected from the material in the library of the geological survey. They do not represent the entire body of publication, but it is believed that they fairly give the ratio of official to private matter. These figures show 105,775 pages on general geology published by the government, to 15,139 pages published by private parties. The ratio of geological maps is about the same; and, comparing the amount of governmental with the amount of private publications in paleontology, the ratio of number of pages is 18,151 to 13,916; the number of plates being as 2,858 to 769.

The publications of the survey contain the writings of nearly all our best geologists; and it is thought by Major Powell that a wide distribution of its scientific reports, placing them at the disposal of one or two libraries in each county in the country, would tend to make the results of the investigations as available as they should be.

It has been especially fortunate for the survey that there exists in the Comstock, Eureka, and Leadville mining districts vast shafts and galleries which have allowed of an unparalleled study of problems in economic geology; and great credit is due to the survey for having taken advantage of these opportunities. As the law establishing the

survey especially requires that economic work should be done, and as the primary function of the survey is the performance of such work, it is evident that this class of investigation has been carried on strictly in obedience to the law, and in fulfilment of its purpose.

The annual output of the mines of the United States aggregates in value about $425,000,000; and, while the economic results of the survey have largely been devoted to this industry, the needs of the agricultural community have not been forgotten. At present investigations are going on of the flood-plain valleys of the great rivers, like that of the Mississippi, for the purpose of determining the conditions under which they can be redeemed; and, on the other hand, of the great arid regions, to determine by what means they may be more economically fertilized by irrigation; and, again, of the coast marshes and interior swamps, to learn the possibility of their utilization by drainage. In the prosecution of its topographical work, the survey is constructing a map of the forests of the country; and in its study of the structural geology it is revealing the conditions under which artesian wells may be discovered, and prognosticating the areas where such wells may be constructed. In the study of the interior hydrography of the country, the survey is developing the conditions under which our towns may obtain a supply of healthful water; and, in this connection, the calls upon the survey for information are many and rapidly multiplying. It is hardly necessary to add, that, in the construction of a topographic map of the United States, the people are supplied with a knowledge of the natural routes for the highways of commerce. It will thus be seen that the work of the survey has practical relations with all the industries of the people, and that it is pre-eminently designed to promote their welfare.

THE RAILWAY TO CENTRAL ASIA.

UNDER the direction of General Annenkoff, the Transcaspian railway has made remarkable progress. At the beginning of the present year it extended from Mikhailovsk, on the bay of the same name, to Ghiaurs, a small station some miles beyond Askabad. From thence to Merv the road-bed is finished, and the stations and bridges are constructing. It is expected that trains will run to Merv this spring, and that by midsummer the road will be completed to the Amu Daria at Charjui, a total distance of one thousand and forty-one kilometres. The harbor at Mikhailovsk is very shallow, and the deep water at Krasnovodsk is too distant; but another spot has been found, twenty-four kilometres from Mikhailovsk, where, by a moderate amount of dredging, the largest vessels of the Caspian can come up to a jetty now building. For the other end of the line, to connect with the railway, steamers of a special type are being constructed, suited to cope with the swift and shallow waters of the Amu Daria. The difficulty presented by drifting sands in the desert is to be met by introducing plants, already tested for such purposes in the arid regions of Algeria; and at the principal stations large quantities of them are already being set out in propagating-houses.

This enterprise is a military road, built and designed by officers of the war ministry, assisted by soldiers, Tartars from the Caucasus, and Turkomans and other inhabitants of the region. The chief difficulty has not been the sands of the desert, but the want of water; the existing wells being far apart, brackish, and hardly sufficient for the ordinary purposes of the caravans. However, it has been determined by experiment, that, at a certain depth in the soil, water exists in sufficient quantity, and increases at greater depths. Artesian wells will therefore be dug, the machinery for which is already on the ground. The worst part of the line determined upon is the desert which extends some two hundred kilometres eastward from the Merv oasis. This, though arid and sandy, produces a growth, sometimes almost a wood, of the 'saxaul' (Haloxylon ammodendron) and other nearly related shrubs, which only disappear at a distance of some forty kilometres from the Amu Daria.

After passing the lesser desert near Mikhailovsk, and reaching the station at Kizil Arvat, the railway takes a direction parallel to the Kopeth range, which coincides with the borders of Persia. It crosses the Akhal oasis, and passes under the walls of Geok Tepe a few yards from the spot where the assault was made by which the fortress was carried. The most important station is Askabad, a flourishing town only three years old, but already enjoying an important commerce with North Khorassan. Farther on, the line passes the Persian village of Lutfabad at a distance of two kilometres, and enters the Attek oasis, now beginning to revive under the security afforded by Russian rule. Duchak, at 391 kilometres from Kizil Arvat, is the most southern point of the line, from which diverge the routes to Séraks, Heshed, and Herat. Here the road turns toward Merv, and enters the desert in a north-westerly direction. There are no brooks or springs, but from the mountains to the south-east come two rivers of importance, — the Tajand or Hari-Rud, and the Murghab. The former is dry in winter, but in summer has twice the volume