haps, to speak more accurately, of the modern aeroplane. While the very idea of splitting the sail to let any portion of air pass through is radically opposed to accepted theories on the subject, Mr. Burnham, the author of the experiments, states that on certain points of sailing the slotted sail showed superior driving power to one of the standard type.

STATISTICAL DUPLICATION.

Statistician Powers, of the Census Bureau, is making special efforts to plan a successful campaign whereby full agricultural statistics shall be gleaned for the coming twelfth census. The law specifies only the crops of 1899 as those to be reported; but, as the census agents will not take the field till after June 1, 1900, and the bulk of the great crops of 1899, especially in the South, will be harvested and marketed long before that time, growers will be expected to furnish statistics to the enumerators, some of which will be quite a year old. It is desired by the Bureau that growers be prepared to do this, and to that effect it is using every channel to notify them of the necessity of being thoroughly posted as to what they grew and marketed, and the prices obtained therefor.

The strange part of all this is that our Department of Agriculture has a most efficient, long trained force for this very purpose; and not only their annual but their monthly statistics are the most complete of anything of the kind attempted in any country. Yet this working force will be entirely ignored, its records passed as of no avail, and exactly the same work and results as theirs will be attempted with comparatively raw, untrained recruits. That such statistics will differ from, and must be of considerably less scientific value than, those of the Department of Agriculture goes without the saying.

We call attention to this just at this time in the hope that it is not yet too late for the press of the country to take the matter up and induce a change of some magnitude to be made in the plans of the Census Bureau. General Merriam is sure to find the funds at his disposal far from what he will require for special features of great value to all students of commerce and political economy, if thousands of dollars are thus used to duplicate the work of the Department of Agriculture.

The same thing might also be well illustrated by reference to the duplications of work now being well done by the Treasury, Interior, Post Office and War Departments.

EXCHANGING FISH FRY WITH EUROPE.

Many tourists who will attend the Paris Exposition next summer need not be surprised if they find on the bills of fare of the leading European hotels such items as "American black bass," "American salmon," or "American muskalonge." It should not be hastily concluded that these items are put there for deceptive purposes, or that they refer to canned or dried American fish. They are in reality true statements of facts, and indicate the growth of our fishing interests under the wise and progressive supervision of the United States Fish Commission. During the past summer American fish, fresh from the water, appeared on the tables of European hotels devoted specially to catering to American tourists.

In order to appreciate the full meaning of this, it is necessary to glance at a feature of the work planned years ago by the Fish Commission. A most thorough and painstaking effort was made then to collect all possible facts concerning our food fishes as a preliminary to adopting adequate methods for protecting and propagating young fry. This scientific study and experiment included an elaborate investigation of the food plants of fish in inland waters, the cause of famines and years of plenty, and the relative chances of certain varieties of fish in strange waters in reaching maturity.

In propagating the young fry for restocking the streams, bays, and rivers, experiments were made to see how well they thrived in waters far removed from their natural habitat. This experiment proved of great commercial value to the country. Inland waters that were almost destitute of fish are now teeming with millions of artificially propagated fry. In some of the new waters they have been transplanted to, the food fishes have been found to thrive better than in the streams where they were found. The extension of this work to foreign waters was anticipated by the Fish Commission years ago purely as a scientific test. Consequently when they received intimations from leading ichthyologists abroad that an exchange of native fry would be agreeable, preparations were immediately made to send our fish to European countries

The first experiment was made in Scotland with our landlocked salmon. The inland waters of Scotland presented conditions somewhat similar to those in which our salmon loved to disport, and besides there was a species of Scotch salmon native to the streams and lakes of that land. Young fry of our landlocked salmon were shipped to Scotland some ten years ago, and in that time they have multiplied rapidly, much to the detriment of the Scotch salmon. The American salmon proved larger and stronger than their native cousins, and the Scotch salmon is almost threatened with extinction by the growing rapacity and multiplication of the American landlocked salmon. On the whole, however, this is not to be regretted, for the American species furnish more and better food than the Scotch salmon.

A shipment of American black bass fry was made to France for stocking the rivers and streams, and, like the American salmon in Scotch waters, they have flourished so marvelously that to-day they are quite common articles of diet at the French hotels and restaurants. The French streams, since the introduction of the American bass, have doubled in their productive value, and there is every reason for the French anglers to be grateful to our American Fish Commission for stocking their waters with a new species of food fish. The French streams were practically deserted when the fry were introduced, and they had little difficulty in taking quick and complete possession of the waters.

Other varieties of fish have been shipped to France and other countries as scientific experiments. The American rock bass has been introduced in several English streams, and the American brook trout is today in flourishing condition in the clear, cold streams of Russia and other northern countries of Europe. The waters of Switzerland abound with many of our common river and brook fish, which make the angling there superior to anything in the past. It is even reported that the fine American muskalonge has found a satisfactory home in the Rhine and Danube Rivers.

In return for these American food fishes we have received few foreign fry that have proved of any particular value. The attempt has been made to introduce the best of the European fish in our waters, but as a rule American fish are superior to any that Europe can produce, and we have not been greatly benefited by the exchange. The Scotch salmon has been tried here, but holds out little promise of success in waters where the American salmon lives There is reason to believe that we will be more benefited in introducing the young fry of South American fish in our northern waters than any that can be brought from Europe. The condition of ichthyology in the countries south of us, however, is such that it is difficult to secure the fry without sending an expedition after them. At present it seems as if we had sufficient varieties of fine, toothsome fish in our waters to satisfy the most fastidious epicure; but it is possible that in its scientific investigations with the fish from all parts of the world, the commission may some day add to our fish diet some new species that will prove of enduring value. Meanwhile, the scientific search after facts concerning the food and habits of our American fish at home and abroad will enable the commission to handle the problem placed before them with more assurance of success. In the comparatively few years it has been laboring in the field it has accomplished results that are well known, and of value alike to the consumer and the sportsman or professional fisherman. There are few scientific studies and experiments that show practical results sooner than that of fish culture. G. E. W.

THE MINING INTERESTS OF AFRICA.

The mining interests of Africa, especially the wonderful gold and diamond fields, are particularly interesting at the present time owing to the unsettled conditions in the Transvaal. Much of the recent rapid development of Africa, especially in the southern part, is due to the discovery and development of extremely valuable mineral deposits, particularly of gold and diamonds, and incidentally it may be mentioned that the iron, coal, and other mineral deposits of South Africa give great promise when the wealth-seekers find time to turn their attention to industries which are less speculative.

The gold and diamond mines are wonderfully profitable. The Kimberley mines, which are located in British territory just outside the boundaries of the Orange Free State and about 600 miles from Cape Town, now supply about 98 per cent of the diamonds of commerce. The existence of these mines as unknown prior to 1867, and in the brief period since their discovery $350,000,000 worth of rough diamonds have been taken from the Kimberley mines, and the stones were easily worth double this sum after cutting. This enormous production would have been greatly increased but for the fact that the owners of the mines in the vicinity formed an agreement by which the annual output was so limited as to meet, but not materially exceed, the annual consumption of the world's diamond markets. The supply is so plentiful and so comparatively inexpensive is the work of diamond digging that the industry has almost ceased in other parts of the world since the South African mines entered the field.

Equally wonderful and promising are the great "Witwatersrand" gold fields of South Africa, located in the South African Republic, better known as the "Johannesburg mines." The strip of territory a few hundred miles long and a few miles in width to which this name is applied was, a few years ago, considered nearly worthless, useful only for the pasturage of cattle and sheep. According to our Treasury Bureau of Statistics, gold was discovered there in 1883, and in the next year the gold production was about $50,000. The output increased with startling rapidity. The amount of gold mined in 1888 was $5,000,000; in 1889, $10,000,000; in 1892, over $20,000,000; in 1895, over $40,000,000; and in 1897 and 1898, $55,000,000 each year. This wonderful development naturally attracted great attention to South Africa and drew thither thousands of people in the hope of making fortunes rapidly. The mines, however, cannot be successfully worked except by the use of costly machinery, and while they have been extremely productive where machinery has been used, they were not of such a character as to make hand or placer mining profitable, as was the case in California and Australia and other places. The gold production of the "Rand," since 1884, has been over $300,000,000, and careful surveys of the field show beyond question that $3.500,000.000 in gold can probably be extracted, while the large number of mines which have been located in adjacent territory, particularly in parts of Rhodesia, give promise of additional supplies, so that it seems probable that South Africa will for many years continue to be as it now is, the largest gold producing section of the world. Recent discoveries tend to the belief that these wonderfully rich mines are the long lost "Gold of Ophir" mines from which Solomon obtained his vast supplies.

RAILROADS IN 1898.

A welcome visitor to the editor's table is "Poor's Manual of Railroads for 1899." The general statistics regarding the roads for the year are most important and authoritative. The general exhibit for the fiscal year shows that the length of our railroads on December 31, 1898, was 186,809 miles, showing an increase of 1,915 miles in the year. There is in addition to the mileage already given 60.344 miles of second tracks, sidings, etc., making a grand total of 245,238 miles of track. Of this mileage, 220,803 miles of track are equipped with steel rails and only 24,435 miles have iron rails. There are 36,746 engines, 25,844 passenger cars, and 1,284,807 freight cars. The total liabilities of the companies are $11,968,751,204; the excess of assets over liabilities is $316,616,498. The total assets are $12,285.367,702. The actual number of miles of railroad operated was 184.532. The total train mileage was 905,-010,232. In 1898, 514,982,288 passengers were carried and the passenger mileage was 13,672,497,664 miles; 912,-973,853 tons of freight were moved. The passenger traffic earnings amounted to $272,589,591. The earnings from freight were $868,924,526. The total earnings from all sources were $1.249,558,724. The net earnings amounted to $389,666,474. The total available revenue was $494,203,378.

These figures show what an enormous business our railroads are doing, and our progress is all the more remarkable when we remember that it was not until 1842 that the railroad was opened from Boston to the Hudson, and from the Hudson at Albany to Lake Erie at Buffalo. In 1848 the progress made in railroad construction was so slow and unpromising that the total mileage of lines completed at the end of that year was only 5,996. In 1848, immediately after the annexation to the United States of California, the deposits of gold of marvelous richness caused great excitement, and the first movement in the construction of railways dates from the discovery of gold in California. From 1849 to 1857, 17,138 miles of railway were constructed. Then came a great commercial revulsion, which commencing in the United States swept around the world. But the nation had grown too strong, however, to suffer anything more than a temporary check. The lines of railroad which had been constructed penetrated every important portion of the country and gave high commercial value to its products. Labor everywhere was then enabled to reap, even in the midst of the great depression that prevailed, a remunerative return.

SODA WATER TO RELIEVE HUNGER.

Water charged with carbonic acid gas—in other words, soda water—is now prescribed as a palliative for hunger, especially for an abnormal sense of hunger due to disease. Says Modern Medicine, which gives us this information: "Carbonic acid gas has the singular property of lessening the sense of hunger, and may profitably be remembered in dealing with cases of diabetes in which bulimia (abnormal hunger) is a prominent symptom. The seat of hunger is found in the solar plexus. By the use of water charged with carbonic acid gas, the branches of the solar plexus distributed through the mucous membrane of the stomach are influenced in such a way that the abnormal irritation of the plexus, which is the foundation for the ravenous hunger often present in diabetes and certain forms of indigestion, may be greatly mitigated, if not wholly appeased. Water charged with carbonic acid gas may likewise be employed with advantage in many cases of hyperpepsia in which there is a sensation present in the stomach described by the patient as a gnawing sensation, 'goneness,' emptiness, etc."