can be done to a great enterprise in the minds of the lay public, by an unfair and prejudiced handling of statistical figures. So far from the work now being done under our army engineers at the Isthmus being inferior in quantity to that accomplished under civilian engineers on one of our great western railroads, it would seem, if we take all the modifying conditions of climate, labor, and length of haul into consideration, to be greatly superior.

THE RELATION OF THE AUDUBON MOVEMENT TO THE SPORTSMAN.

BY E. S. BOWDISH,

The true relation which Audubon societies bear to the sportsmen of the country (and within the term I mean to include only *true* sportsmen) is very much misunderstood by a great many, among whom are some of the sportsmen themselves. While running the exhibit of the National Association of Audubon Societies at the Sportsmen's Show of the Forest, Fish, and Game Society of America, in New York, recently, several visitors expressed surprise to the writer that the Audubon societies should be thus joining with sportsmen. They went away assured that instead of there being any antagonism, the most complete accord existed between true sportsmen and the Audubon organizations. To some sportsmen inquiring as to the exact contentions of the Audubon societies, it was explained that they stood for the passage and enforcement of such laws as would insure the preservation of game, and for the absolute protection of harmless and beneficial non-game and insectivorous birds. In no case did this explanation fail to elicit prompt and hearty approval.

The real sportsman is a true protector of non-game birds. Their charm contributes greatly to the pleasure of his outings, and by them, in common with the rest of humanity, he is benefited in a practical way. In the matter of game, too, he stands for preservation, not for extermination, and his appreciation of actual conditions is far more accurate than that of the sentimental theorist, his sympathy more direct and personal. On the other hand, the cordial relation of the Audubon societies toward the sportsmen is shown by the results of their work. In North Carolina the State Audubon Society was in 1903 incorporated to perform the functions of a fish and game commission, and since that time has continued to serve the State with such general satisfaction to sportsmen and citizens that in February, 1907, the South Carolina Audubon Society was incorporated along the same lines. Alabama, a year since one of the worst States in the Union as to game protection, from which bobwhites were annually shipped by wholesale, early in 1907 adopted a bird and game law drafted by the most earnest and active Audubon worker in the State, and indorsed by the National Association, and the author of this law, John H. Wallace, Jr., was made Game Commissioner. As a result, the State, from being one of the most backward, has become one of the most progressive game protective States, and words of praise for the law and the Commissioner are heard on all sides from the sportsmen of the State.

Tennessee has now a very good game law, which the National Association of Audubon Societies was influential in securing, and Georgia, as a result of persistent effort on the part of the same organization, has greatly improved in this respect. In Texas, during the winter of 1906-7, Mr. Charles E. Brewster, game law expert and ex-State Game Warden of Michigan, was maintained at very considerable expense by the National Association for the purpose of educating the people and assisting the able secretary of the Texas Audubon Society, Capt. Davis, and the sportsmen of the State in securing the enactment of good game laws and providing for their enforcement. The result has been the correction of very serious abuses and the establishment of bright prospects for the preservation of the State's game. In Connecticut during the last session of the Legislature the influence of the National Association and the Connecticut Audubon Society was most potent in securing the enactment of a hunter's license law, which has met with the hearty approval of by far the greater number of sportsmen. The non-spring shooting law was also secured largely as the result of the efforts of these organizations. In Illinois the open season on woodcock and mourning doves has been shortened a month; the day's bag of waterfowl and ducks reduced from thirty-five to twenty, and for quail and other game birds from twenty-five to fifteen. In Massachusetts the National Association has contributed to the fund which is to be used in the experiment looking to the preservation from extermination of the remnant of the once abundant heath hen, now reduced to a few pairs on the island of Martha's Vineyard. In New Hampshire a law was secured making a five years' closed season on the wood duck and upland plover. In New Jersey the attempt last year to secure a non-spring shooting law resulted in the bill dying in the Senate Fish and Game Committee as the result of the opposition of

one man. This year sportsmen have awakened to the conditions and necessities, and co-operation of the sportsmen's clubs is already so well assured as to give good promise of securing the passage of both this law and a hunters' license law.

One of the good works accomplished in New York has been the defeat of bills to permit the sale of certain foreign game birds in the closed season. These bills in various forms have been introduced at each session of the Legislature for several years. The adoption of such a law would almost surely result in fraud, and the illegal selling, consequently killing, of native game birds.

In a paper of the limitations of the present one, it is obviously impossible to more than briefly touch on some of the more important work looking to game protection which the National Association of Audubon Societies and the various State Audubon societies have accomplished in co-operation with the sportsmen of the country. As to the aims and principles of the National and State societies, they may be briefly summed up in a repetition of the statement that these organizations stand for the adoption and enforcement of such laws as will insure the continued preservation of all species of game, and for the absolute protection of all harmless or beneficial non-game birds and animals. They advocate the total abolishing of spring shooting, because by such wasteful methods many species of game are surely being brought to extermination; they advocate the adoption of a hunters' license, first because it places the cost of game protection on those who enjoy the sport of shooting, highest on the alien who is most frequently a violator of the game and non-game laws, next on the non-resident who does not otherwise contribute to the support of the State, and merely nominal on the resident sportsman, who is almost always perfectly willing to contribute to the support of his pastime; second, because it enables the game commission to keep tabs on who does the shooting, legal and otherwise; they advocate non-sale of game, because while there is a market for game, worthless individuals who would rather make a precarious living by shooting than to work for it will violate all game laws and disregard all bag limits, and such men and methods are a potent factor in game decrease; they advocate a closed season for a term of years on such birds as the wood duck, woodcock, and upland plover, which, sadly reduced in numbers, are threatened with extermination unless thus given a chance to recuperate. In the case of the wood duck, several hundred letters sent out by the association a few months since to prominent ornithologists and sportsmen throughout the country, asking the present status of this bird, elicited replies which almost without exception were to the effect that the bird had either entirely disappeared or had become exceedingly scarce in the locality of the writer, and it is a question if the case of the woodcock and upland plover is not even more desperate.

The methods by which the objects of the Audubon societies are sought to be obtained are: education of the people as to the economic and æsthetic value of the birds and wild creatures; legislation, the advocacy of good laws and opposition to bad ones; the employment of wardens to guard breeding colonies of birds. Their fellowship with kindred organizations is international, and their active assistance as far extended as the Bahamas and to the Game Warden of Prince Edward's Island. Sometimes sportsmen whose viewpoint is restricted by the limits of local experience and knowledge are inclined to disagree with some of the reforms advocated by the National Association, whose experience and knowledge of game matters covers the entire country. A non-spring shooting law does not always appeal to the sportsmen of a State when the neighboring States have no such laws; they forget that a beginning must be made somewhere, that simultaneous action by a number of States is almost impossible of achievement. However, the wider a sportsman's experience, the more completely do his views accord with the aims of the Audubon societies.

Practically, the Audubon movement came into the field when there was almost no protection of non-game birds, when some of the most valuable insect and weed-seed eating birds were slaughtered wholesale, when the seabirds were being fast exterminated for the millinery trade, and many States had almost no game laws, while the laws of others were a mere farce, owing to non-enforcement. To-day model non-game laws are in force in thirty-eight States, and game laws are far better, and better enforced than ever before, and tend constantly to improvement. This is largely the work of the Audubon movement, and it is no wonder that it meets with the hearty appreciation of sportsmen and nature lovers everywhere.

The introduction of electric traction on railroads that have long tunnels appears, says the Electrical World, to have had an extraordinary effect on the development of short and long tunnel schemes in Switzerland. Some of the plans for intercantonal and inter-

national routes are very ambitious, involving sums as large as \$55,000,000 in individual instances. Including local trolley enterprises, there are already in Switzerland 111 projects for which concessions have been granted. It is obvious that the execution of even a small number of these projects would not only require a very large sum of money, but would call for large quantities of hydraulic and electrical apparatus.

FLYING AS A SPORT—ITS POSSIBILITIES.

BY WILBUR WRIGHT.

Up to the present time men have taken up flying partly from scientific interest, partly from sport, and partly from business reasons, but a time is rapidly approaching when the art will have reached a state of development such that men can practise it without the necessity of maintaining a private laboratory or a manufacturing plant.

Considered as a sport, flying possesses attractions which will appeal to many persons with a force beyond that exercised by any of the similar sports, such as boating, cycling, or automobiling. There is a sense of exhilaration in flying through the free air, an intensity of enjoyment, which possibly may be due to the satisfaction of an inborn longing transmitted to us from the days when our early ancestors gazed wonderingly at the free flight of birds and contrasted it with their own slow and toilsome progress through the unbroken wilderness. Though methods of travel have been greatly improved in the many centuries preceding our own, men have never ceased to envy the birds and long for the day when they too might rise above the dust or mud of the highways and fly through the clean air of the heavens.

Once above the tree tops, the narrow roads no longer arbitrarily fix the course. The earth is spread out before the eye with a richness of color and beauty of pattern never imagined by those who have gazed at the landscape edgewise only. The view of the ordinary traveler is as inadequate as that of an ant crawling over a magnificent rug. The rich brown of freshly-turned earth, the lighter shades of dry ground, the still lighter browns and yellows of ripening crops, the almost innumerable shades of green produced by grasses and forests, together present a sight whose beauty has been confined to balloonists alone in the past. With the coming of the flyer, the pleasures of ballooning are joined with those of automobiling to form a supreme combination.

The sport will not be without some element of danger, but with a good machine this danger need not be excessive. It will be safer than automobile racing, and not much more dangerous than football. The motor flyers will always be somewhat expensive, as the best of materials and workmanship will be required in their construction; but there is a possibility that men will eventually learn to fly without motors, after the manner of the soaring birds, which sail for hours on motionless wings. In such case the flyer would be so small and simple that the original cost would be very moderate, and the fuel expense done away with entirely. Then flying will become an every-day sport for thousands. We may not live to see that day, but with thousands of buzzards, eagles, hawks, and sea birds giving demonstration of the possibility of soaring flight every day of the year, no good reason exists for asserting that human flight without motors is entirely visionary. Meanwhile the motor-driven flyers will become sufficiently numerous to afford great sport, not only to the amateur aviators, but also indirectly to the general public, for the flying-machine races of the future will surpass anything the world has yet seen as spectacular performances.

In ballooning, a few glorious hours in the air are usually followed by a tiresome walk to some village, an uncomfortable night at a poor hotel, and a return home by slow local trains. With a flyer, which returns the sportsman to his starting point, thus eliminating the uncomfortable features of the balloon trip, aerial sport will appeal to a wider class than has heretofore been the case.

SOME IMPRESSIVE WIRELESS STATISTICS.

That wireless telegraphy is becoming a powerful factor in overseas communications is shown by statistics collected by J. Erskine Murray. He gives the number of stations as 1,550, classified approximately as follows:

Commercial land stations, 195; merchant vessels, 170; lighthouses, etc. (government stations), 150; naval installations, 670; military portable installations, 55; experimental stations, 310. These 1,550 stations had been erected by the various companies in approximately the following proportions:

Telefunken, 41 per cent; Marconi, 20 per cent; De Forest, 6 per cent; Lodge-Muirhead, 3 per cent; Fessenden, 3 per cent; other systems, 27 per cent. As regarded commercial land stations the proportions were: Marconi, 32 per cent; other systems, 68 per cent. On merchant vessels: Marconi, 56 per cent; other systems, 44 per cent.