use of the more modern measuring instruments and apparatus. Four seminars will be held to afford opportunity for the presentation of recent developments in allied fields of engineering mechanics. The course will be concluded by two all-day conferences on "Fatigue and Creep," at which various aspects of these two subjects will be discussed.

ONE fourteenth of the total population of the United States, or 9,929,432 people, visited the 134 national parks and monuments in 1936, a gain of more than four million over 1935, and a gain of more than six million over the depression year 1931, when only 3,619,900 persons visited the areas. 1,772,338 people visited the parks in private cars during 1936 as against 1,217,054 in 1935. The newly established Shenandoah National Park, Virginia, dedicated on July 3, 1936, was visited by nearly 700,000 people; the Great Smoky Mountains National Park, on the border of North Carolina and Tennessee, by 602,222; Acadia National Park, Maine, by 340,393, and Mammoth Cave National Park, Kentucky, by 57,775. In the West, Rocky Mountain National Park, Colorado, reports 550,496 visitors; Yellowstone National Park, Wyoming, 432,570; Yosemite National Park, California, 431,192; Mount McKinley National Park, Alaska, 1,073.

A 2,200 acre wildlife refuge will be established by the U. S. Biological Survey in the Patuxent River valley section of Maryland. It has been named the Patuxent Research Refuge. The refuge, part of the National Agricultural Research Center of the Department of Agriculture at Beltsville, is about fifteen miles northeast of Washington. Wild turkeys, ruffed grouse, white-tailed deer, beavers, muskrat and other wildlife, once abundant in this section, are to be restocked on the refuge. Certain areas of the refuge will also be set apart for demonstrating wildlife management practices. On these tracts the Biological Survey will show how the latest facts found through research and experiment can be applied. Snowden Hall, an old-time southern mansion, is located on the refuge. It is to be reconditioned for the refuge headquarters, and other necessary buildings will be provided. A new laboratory building will be one story and basement. It will contain an office, three biological laboratory rooms, a room for housing wild birds and animals infected with disease, another for healthy animals and birds, and rooms for examining and storing specimens.

A PLAN to establish Pan-American postgraduate schools and hospitals in all the large cities of Central and South America was discussed recently, at a meeting of physicians at the Metropolitan Club, New York City, by Professor José Arcé, dean of the University of Buenos Aires. Professor Arcé, who is president of the Argentine Chapter of the Pan-American Medical Association, was the guest of honor at a dinner of the New York Chapter of the association. Speakers for the United States were Dr. Charles Gordon Heyd, president of the American Medical Association; Dr. James Ewing, of Memorial Hospital, and Dr. Dean Lewis, of the Johns Hopkins University. The plan announced by Professor Arcé is for the establishment throughout the republics of Central and South America of medical centers similar to the one proposed recently for New York City.

DISCUSSION

THE "PRIMARY CHANGE" IN ADRENAL INSUFFICIENCY[1]

IN his communication to SCIENCE entitled "The Significance of the Adrenals for Adaptation," Selye[2] makes the following statement. "It seems quite likely that the loss of sodium which is the basic change according to those who believe in the sodium deficiency theory (Loeb, *et al.*) or the increase in potassium (Zwemer) . . . all of which have been considered to be the primary change—are also symptoms rather than the cause of adrenal insufficiency." We have consistently avoided any expression which would suggest that we believe in a "sodium deficiency theory" or any other theory assigning a single function to the adrenal cortex. Furthermore, it is our opinion that the promulgation of any unitarian hypothesis concerning the function of the adrenal cortex tends, at this time, to inhibit the advance of physiological knowledge in this field.

It is indisputable that the regulatory effect of the adrenal cortex upon sodium metabolism is *one* of its important functions. The very fact that the single procedure of sodium withdrawal will induce acute adrenal insufficiency in the Addisonian patient[3] and the adrenalectomized dog is of obvious significance. Moreover, Harrop[4] has shown that totally adrenalectomized dogs will live for months without cortical extract if sodium salts are ingested in sufficient quantities.

On the other hand, we wish, in view of Selye's statement, to emphasize here, as we have in other publications, that the physiological activities of the adrenal cortex are varied and complex. In 1934,[5] we stated

[1] From the Department of Medicine, College of Physicians and Surgeons, Columbia University, and the Presbyterian Hospital, New York City.

[2] H. Selye, SCIENCE, 85: 247, 1937.

[3] R. F. Loeb, *Proc. Soc. Exp. Biol. Med.*, 30: 808, 1933.

[4] G. A. Harrop, L. J. Soffer, W. M. Nicholson and M. Strauss, *Jour. Exp. Med.*, 61: 839, 1935.

[5] R. F. Loeb and D. W. Atchley, *Med. Clin. of North America*, Vol. 17, New York Number, No. 5, 1317, 1934.

that "it should be emphasized that we do not assume that the regulation of salt balance is the sole function of the adrenal cortex." Furthermore, we have pointed out[6] that the adynamia, hypotension, hypoglycemia, pigmentation, gastro-intestinal symptoms and neurological disturbances of Addison's disease may occur without a decrease in sodium, and finally,[7] that "strength increases strikingly in the adrenalectomized dog following the administration of cortical extract before obvious changes occur in the blood urea or sodium concentration or in the water content of the blood serum."

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"MIGRATION" AND "HOMING" OF SALMON

BY derivation "migration" signifies "wandering." It has come to mean, especially in biology, a definite, purposive movement, preferably "en masse." The salmon is an outstanding example of the fishes that are supposed to show such movements. The Atlantic salmon (*Salmo salar*) spends a number of years as a parr in its natal river before transformation into the smolt stage. The latter is considered to make a feeding migration to the ocean and after several years when an adult a spawning migration back to its natal river. For their return "from the ocean" perhaps to "points far distant from their own rivers" and for their subsequent "travel along the coast" Calderwood[1] states "they find their way by a homing instinct which man can not comprehend."

On inquiry and examination of the literature I have failed to find a single clear case of a salmon returning to its natal river from a distant place in the sea, that is, away from the neighborhood of the river mouth. Admittedly this is a difficult thing to prove, since we must be sure of three things for the individual fish: (1) Which is its natal river? (2) where it has been in the sea, and (3) that it is again in its river. Perhaps some one may be able to produce such evidence. Without it, however, it seems pointless to speak of a "homing instinct."

The movements that have been definitely shown may be placed in three categories: (1) Fish marked as smolts or tagged as kelts in a certain river, being recaptured in that river after having left it, but not necessarily having gone from the neighborhood of the river mouth; (2) fish marked as smolts or tagged as kelts in a certain river being recaptured at a near or distant place in the sea or in another river; and (3) fish tagged in the sea and recaptured at another place in the sea or in a river. There may be mentioned for the Atlantic salmon Alm's[3] experiments in the Baltic, Dahl and Sømme's[4] for the Norwegian coast, those of Calderwood[5] and others for Scottish waters as well as the Canadian ones.[2,6] There have been similar experiments with the Pacific salmons.[7]

In quite a number of instances salmon marked or tagged in one river have been recaptured in another, which constitutes definite evidence against homing. White[2] has shown that this may occur even when the fish is presented at a fork in a common estuary with a choice between another river and its own.

If the traditional conception of salmon migration falls to the ground for lack of definite proof and with clear evidence to the contrary, what is to replace it? The facts show that the salmon wanders to and fro in the sea and this may be considered a migration. Such slight evidence as we have and the analogy of the herring point to these excursions being made when the fish is not feeding. Their range seems to increase with the size of the fish[8] and also, it may be confidently affirmed, with rise in temperature from the winter low, which may be less than 0° C. When the salmon are within the zone of the river's influence at sea these excursions seem to be definitely controlled by a sufficiently steep gradient in the proportion of river water, so that the salmon tend to remain where the proportion is high, as shown by the distribution of the salmon in relation to the outflow of Saint John River water into the Bay of Fundy.[8] The Scottish River Tay similarly has a pronounced zone of influence at sea,[5] and the two rivers agree in that none of the salmon kelts tagged and liberated in them has ever been reported as recaptured in the sea outside the zone of influence or in another river.

It would seem that if a fish happens to get very far from this zone of river influence there is little likelihood that it will in its random wanderings reach the place where the marked gradient occurs. It may then be said to be "lost." Such salmon may reach neighboring rivers or travel very far in the sea. Though they wander to and fro, yet is their course in part determined by the movement of the water. As they tend to keep near the surface, it is not surprising to find that

[6] R. F. Loeb, *Jour. Am. Med. Assn.*, 104: 2177, 1935.
[7] J. Stahl, D. W. Atchley and R. F. Loeb, *Jour. Clin. Invest.*, 15: 41, 1936.
[1] W. L. Calderwood, "A Survey of Salmon Fisheries in Eastern Canada," p. 4, 1930.
[2] H. C. White, *Jour. Biol. Bd. Can.*, 2: 391–400, 1936.
[3] Gunnar Alm, *Ny Svensk Fiskeritidskrift*, 1: 1–6, 1931.
[4] K. Dahl and S. Sømme, *Skr. Norsk. Vid.-Ak. Oslo*, I. *Mat.-Nat.* Kl., 1935, No. 12.
[5] W. L. Calderwood, "The Life of the Salmon," 1908.
[6] A. G. Huntsman, *Bull. Biol. Bd. Can.* 21: 78–92, 1931.
[7] W. H. Rich and H. B. Holmes, *Bull. U. S. Bur. Fisheries*, 44: 215–264, 1928; J. O. Snyder, *Calif. Fish Bull.*, 34: 67–81, 1931; "Pacific Salmon Migration," various articles by H. C. Williamson, C. McC. Mottley and others in *Contr. Canad. Biol. Fish.*: 3 and 4, and in *Bull. Biol. Bd. Can.*, 14, 15, 16, 26, 27, 31, 40, 41.
[8] A. G. Huntsman, *Bull. Biol. Bd. Can.*, 51: 14–15, 1936.
[9] Ann. Rep. Dept. Fisheries Can., 4, 5 and 6: 113, 130 and 130–131, 1934, 1935 and 1936.