Rats	2
Red-headed Woodpecker	20
Robin	1
Skunk	1
Snakes	10
English Sparrows	84
Squirrels (Gray)	2
Toads	3
Animals[2]	3
Total	230

The observations on the number of animals killed were all made on trips of from eight to fifty-four miles, in most cases, starting from Champaign, Illinois. The total number of 230 dead animals probably represents the animals killed within three days of the time the examinations were made. In one case, a gopher was killed by an automobile immediately in front of the one in which the observer was riding, and on returning over the same route about eight hours later, the body of the gopher was found flattened out and nearly dry, having been run over by a large number of automobiles in the interval since it was killed. It is doubtful if the body of the animal would have remained on the highway another day. In another case, the body of a sparrow disappeared from the highway on the third day after it was killed.

On the cement highways of Illinois, the automobile traffic is usually very heavy, and through the country an average speed of from twenty-five to thirty-five miles an hour is maintained by nearly all cars. Animals killed on such highways are repeatedly run over, and all moisture is rapidly crushed out of the bodies, and in a short time they are blown off by the wind, or by the air from passing automobiles.

There are several things of special significance in connection with the dead animals noted in these observations. If the observations are taken by months, and considering only those animals which occurred in largest numbers, we find that during April observations on fifty-four miles of highway showed:

Sparrows	3
Rabbits	4
Snakes	5
Gophers	10
Red-headed Woodpeckers	0

On the sixty-eight miles of highway observed in May were found:

Sparrows	7
Rabbits	5
Snake	1
Gophers	8
Red-headed Woodpeckers	0

[2] Animals in the same condition as birds.

On the seventy-four miles of highway observed in June were found:

Sparrows	10
Rabbits	6
Snakes	3
Gophers	6
Red-headed Woodpeckers	5

On the sixty-four miles of highway observed in July were found:

Sparrows	30
Rabbits	7
Snake	1
Gophers	4
Red-headed Woodpeckers	14

On the thirty-nine miles of highway observed in August were found:

Sparrows	34
Rabbits	0
Gopher	1
Red-headed Woodpeckers	3

Apparently the sparrows are killed in the greatest numbers during the time that the young are most abundant. It is also possible that the larger kill of sparrows during July and August was due, at least in part, to the fact that during this period small grain was being threshed generally throughout the farming districts and hauled in wagons over the concrete highway to elevators. Small amounts of grain were scattered from the wagons over the highways, and it is probable that many of the sparrows killed were surprised while feeding upon this grain. It would seem that the greatest number of snakes are killed during the spring months, when they are just coming out of hibernation and are more or less sluggish. The number of rabbits remain fairly constant throughout the summer, but the number of gophers decreased slightly after the spring months. It is also apparent that the red-headed woodpeckers were killed in greatest numbers during midsummer, and as many of the birds observed were young it seems likely that these are killed in greatest numbers shortly after the time when they leave the nest. The small numbers of chickens killed was rather surprising and it is probable that a greater effort is being made to keep them off the highways.

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ON EINSTEIN'S THEORY OF RELATIVITY

PROFESSOR ALBERT EINSTEIN and other experts have repeatedly stated that, although the theory of rela-

tivity was originally derived from Michelson and Morley's experiment, its very *"experimentum crucis,"* its *decisive experiment,* is based on Fresnel-Fizeau's effect. Undoubtedly in the certainty of result this laboratory experiment very much surpasses Michelson and Morley's so-called ether drift experiment. This depends on the velocity of the earth in an hypothetical way; that velocity is a circumstance outside the laboratory, quite beyond our control, not changeable, not reversible. In Fizeau's experiment, on the contrary, the main cause of the effect and all details are well controllable, exactly determinable and they may be changed at will.

Now then, this *"experimentum crucis"* was not even mentioned in recent discussions! Is this experiment, so emphatically pointed out as decisive, now quite worthless? What remains then of the alleged steel logic in Einstein's theory?

My paper[1] shows that the usual interpretation of Fizeau's effect, in the sense meant by Fresnel's dragging coefficient, derives from a subtle error. This I explained more in detail and confirmed in my book "Nouvelles Vues Faraday-Maxwelliennes" with "Supplément. Sur la Propagation de la Lumière" (Gauthier-Villars et Cie, Paris, 1924). My paper "On Kinematics,"[2] treats the same fundamental question in another way. According to my result the true sense of Fizeau's effect is quite different from what we formerly admitted, it being the reserve. However, this in no way lessens the certitude and importance of the experimental result.

Professor Dayton C. Miller claims a result for his repetition of Michelson and Morley's experiment, which at the most is 30 per cent. of the calculated effect. The discussion has shown that that result is questionable on account of several grounds. In this respect I quite agree with Professor Einstein. That is to say, Professor Miller certainly observed an effect of the given magnitude, but the question remains: is it due to the alleged ether drift? There is no uncertainty of this kind in Fizeau's experiment. The recent excellent experiments by Professor P. Zeeman, Amsterdam University, fully confirm the formula for Fizeau's effect established according to my views, without introducing any hypothesis. In fact, Zeeman's experiments, which are universally acknowledged to be correct, confirm my formula to practically 100 per cent.

Zeeman's result is the decisive disproof of Einstein's theory.

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[1] *Comptes Rendus,* CLXXV, p. 574 (1922).

[2] *Philosophical Magazine,* XLIX, p. 579, March, 1925.

IODINE IN THYROID DEFICIENCY

PERHAPS in addition to Miss Simpson's statements (SCIENCE, February 5, 1926) regarding the use of iodine in thyroid troubles, certain remarks by Boussingault in his "Viajes Científicos a los Andes Ecuatoriales" (Spanish translation by Acosta, I have not the original French text) may be of interest. In one "Memoria" he definitely states (1825) that "till now, iodine is the only specific known for goiter." Elsewhere he continues, regarding certain mineral springs in Colombia, "In the province of Antioquia no other salt is used, save that from these peculiar springs, whose waters I have analyzed and convinced myself that, though the composition of their salts is variable, there is in all an appreciable amount of iodine. Hence the reason that there is no goiter in Antioquia: each inhabitant takes every day a dose of iodine with the salt he consumes." Again: "It is a singular fact that for more than a century these waters have been recognized as a sure specific for goiter."

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SCIENTIFIC BOOKS

The Biology of Fishes. By HENRY M. KYLE, M.A., D.Sc., Sidgwick & Jackson, Ltd., London.

KYLE'S "Biology of Fishes" is a very complete and useful work, covering almost every phase of fish life and generally in touch with the latest investigations in anatomy and physiology. The author recognizes fully that the fishes constitute an expanding and diverging as well as very ancient type. The reptiles, birds and mammals are, so far as their origins are concerned, all of them divergent groups which have arisen from the fishes, and in some regards no more different from their primitive ancestors than these differ from one another.

One does not willingly criticize so excellent a book, but a few minor points may be noted. Apparently common heredities are not adequately considered as compared with likenesses due to surroundings. The mass of fishes would appear to form a pool from which individual structures and customs can be drawn out for examination without much reference to heredity, although the latter is the basis of rational classification. The distinctions between homologies and analogies are not always clear in the author's statements and structures are often assigned to secondary cause of recent date, when their real origin may be far older and even beyond the reach of investigation. The true sources of most structures must be sought in heredity rather than the immediate response to environment on the part of a living species.