tion of urea, he says, "As urea is highly soluble, it is never spontaneously deposited. It varies in amount with different diseased conditions: e.g., in febrile and inflammatory affections it is increased in the forming stage, and diminished in that of defervesence; in diabetes mellitus and simplex it is excessive in the urine; while in acute yellow atrophy of the liver it may be entirely absent. In acute and chronic Bright's disease there may be a decided falling-off from the healthy proportion, causing a lower specific gravity. In such cases there is more or less danger of uræmia." These clinical notes are well and concisely written, and increase the value of a book which is in all other respects excellent.

NOTES AND NEWS.

DR. EMIL BESSELS, the eminent Arctic explorer, died suddenly on Saturday, March 31, at Stuttgart. His death was reported here on Monday, but not confirmed until Wednesday. He was well known to American scientists, as he lived in Washington after his return from the 'Polaris' expedition, of which he was a member. He died while in his native country, where he was about to publish a number of works.

— The incessant endeavors of the Providence Franklin Society to organize a geographical survey of the State of Rhode Island have at last been successful. The Legislature of that State has voted a sum of five thousand dollars for a topographical survey, and appointed a commission of three to contract for and superintend the work. Prof. Winslow Upton, Mr. Mills, and David W. Hoyt were appointed commissioners.

— Th. Macfarlane, in the third 'Bulletin of the Laboratory of the Inland Revenue Department of Canada,' comments upon the adulteration of coffee in Canada. Among eighty-five samples collected in various cities of Canada, only forty-four, or fifty-two per cent, were genuine, while the rest were to a greater or less extent mixed with chiccory and roasted grain and peas. Among the samples occurred some described as "chiefly roasted grain with chiccory and a little coffee." As these samples were bought by revenue officers, it is probable that in reality the percentage of adulterated coffee is still greater than the above figures indicate.

— Dr. Götz Martius of the University of Bonn publishes a lecture upon the aims and results of experimental psychology, in which he makes a high claim for the admittance of this science to an acknowledged place upon the curriculum of every university. The immediate occasion of the address was to arouse an interest in this line of research among the members of the university at Bonn, and to urge the establishment of a laboratory where Professor Lipps, the well-known psychologist, and himself, can have the opportunity of contributing to the advance of this growing science. There are several indications that the leading educational institutions of this country will advocate a similar department in the near future.

— The Imperial Observatory of Rio de Janeiro plans the publication of a universal dictionary of climatology. For this purpose, the director, Mr. L. Cruls, has prepared and sent out a circular soliciting information from all official and private sources as to the climatic elements of places at which observations have been or are being carried on. A table is attached to the circular, in which the results of observations are to be inserted. The mean temperatures of the months of the year, the mean maxima and minima, humidity, days and amount of precipitation, cloudiness, frequency of gales, days of frost, prevailing winds, the absolute maxima and minima, the mean annual barometric pressure, and the mean annual oscillation of the latter, are the points on which information is solicited.

— Last summer Prof. B. W. Evermann of the State Normal School, Terre Haute, and Prof. O. P. Jenkins of De Pauw University, spent their vacation at Guyamas, Mex., on the Gulf of California, collecting fishes. They packed their specimens and shipped them for home, but they did not arrive until recently, having been lost somewhere. Professors Evermann and Jenkins will arrange the collection this summer, and prepare the results of their work for publication.

— In *Science* for March 9, p. 119, 1st column, 5th line from bottom, for 'homogeneous' read 'homonymous,' for 'image' read 'images,' and for 'it' read 'they.'

LETTERS TO THE EDITOR.

Dr. Edward Tyson and the Doctrine of Descent.

ONE of the things most strongly emphasized by the recent publication of Charles Darwin's letters is his conscientious recognition of the claims of others to the first discovery of either the law of descent with variation or the principle of natural selection. The pains he took to prefix to the later editions of his work on the origin of species an historical sketch, is evidence of his earnest desire to do full justice to all previous explorers in his field. He, however, did not consider it incumbent on him to look beyond the narrow circle of those who had distinctly and explicitly expounded a doctrine of derivation. Nevertheless, for the future historian of scientific belief, the mere foreshadowings and beginnings of the modern idea of the origin of species, which Darwin set upon a firm basis of inductive proof, cannot but have an enduring interest and importance.

In this view of the matter, I feel that I may perhaps claim space in your journal to call attention to the work and writings of a man who does not seem to have been mentioned heretofore in connection with this subject, but who undoubtedly had at least a vague presentiment of the coming theory of the descent of man, derived from anatomical investigations, which, even at the present time, would probably be regarded as skilful and exact. I refer to Dr. Edward Tyson, fellow of the Royal Society and of the College of Physicians, and otherwise distinguished in his day as a man of learning and ability, who published, in 1699, his treatise entitled '*Orang-Outang, sive Homo Sylvestris; or the Anatomy of a Pygmie compared with that of a Monkey, an Ape, and a Man.*'

It is pleasing to observe in this book not only the carefulness with which Dr. Tyson traced the differences and resemblances between the parts and organs of the little monkey brought to him from Africa and the homologous parts in the higher primates, particularly man, but also the ingenuity and insight with which he drew inferences, which, if freed from the repressing influences of the seventeenth century, we can hardly doubt would have extended to the clear discernment and acceptance of the general law of development. The details of his anatomical comparisons there is not room for here; but some of his theoretical views may, I think, be referred to without exceeding proper limits.

In the first place, he seems to have perceived, though dimly, the main basis of evolution; for, amongst other similar reflections, he says, "I find there are intermediate *Species* of *Beings* between *Vegetables* and *Animals*, as the *Zoophyta*; the *History* of which I could extreamly desire might be given us; and cant but think that regularly in compiling a *History* of *Animals*, one should commence from them; and amongst these, no doubt, but that there are several degrees of Perfection, till we come to what might be properly called an *Animal*." And in another place, with still more particularity, he tells us, "Tis a true Remark, which we cannot make without Admiration; That from Minerals to Plants; from Plants to Animals; and from Animals to Men; the Transition is so gradual, that there appears a very great Similitude, as well between the meanest Plant, and some Minerals; as between the lowest Rank of Men, and the highest kind of Animals. The Animal of which I have given the Anatomy, coming nearest to Mankind; seems the Nexus of the Animal and Rational."

As if it were not enough to thus skirt along the edge of the doctrine of derivation, our author appears to have actually had a prophetic eye upon the great leader in the scientific renaissance of the nineteenth century, when he exclaims that "it would be the Perfection of Natural History, could it be attained, to enumerate and remark all the different *Species*, and their *Gradual Perfections* from one to another." And with the same irresistible impulse which Darwin possessed, to philosophize as well as observe, he further on explains with reference to his own comparative survey of his pygmy with a monkey, an ape, and a man, that, "by viewing the same Parts of all these together, we may the better observe *Nature's Gradation* in the Formation of *Animal* Bodies, and the Transitions made from one to another."

It is interesting to observe, also, that Dr. Tyson not only anticipated, in a measure, the methods and conclusions of the Darwinian period, but even, in some cases, made use of the very terms and

phrases which we have come to associate with that period alone. Thus he declares "that in this *Chain* of the *Creation*, as an intermediate Link between an *Ape* and a *Man*," he would place his pygmy. Elsewhere, however, he cautiously explains that his pygmy "is no *Man*, nor yet the *Common Ape;* but a sort of *Animal* between both; and tho' a *Biped*, yet of the *Quadrumanus-kind;* tho' some *Men* too, have been observed to use their *Feet* like *Hands*, as I have seen several." In another place he gives it as his opinion that "we may safely conclude, that *Nature* intended it a *Biped*," though he apparently feels bound to add the qualification, "yet I still think it but a sort of *Ape* and a meer *Brute*." In fact, all through his comparison he is careful to aver, that, while "our Pygmie more resembles a *Man* than *Apes* and *Monkeys* do . . . where it differs, there 'tis like the *Ape-kind*."

In the summary of the results of his dissections and comparisons, he gives tables of the particulars in which "the Orang-Outang, or Pygmie, more resembled a Man, than Apes and Monkeys do," and of those in which "the Orang-Outang, or Pygmie, differ'd from a Man, and resembled more the Ape and Monkey-kind." The points of resemblance to man he enumerates as forty-eight, and the points of difference as thirty-four. It is a curious fact that some of his points of similarity are the very ones that Darwin has made prominent by the attention which he has given to them. For example: Dr. Tyson refers to the form of the ears, in regard to which he says, "None could more resemble those of a *Man* than our Pygmie's; both as to the largeness, colour, shape, and structure. Here I observed the *Helix, Ant-Helix, Concha, Alvearium, Tragus, Anti-Tragus*, and *Lobus*." Like Darwin, too, he traces the rudimentary tail, of which he remarks, "The *Os Coccygis* had but four *Bones*, and these not perforated, as tis in *Man;* In *Monkeys* there are more *Bones*, and they are perforated." Darwin attaches importance to the fact "that the hair on our arms tends to converge from above and below to a point at the elbow." Dr. Tyson notices the same peculiarity, of which he remarks, "The tendency of the Hair of all the Body was downwards; but only from the Wrists to the Elbow 'twas upwards; so that at the Elbow the Hair of the Shoulder and the Arm ran contrary to oneanother."

In his work on the descent of man, Mr. Darwin makes the following statement: "It is notorious that man is constructed on the same general type or model with other mammals. All the bones in his skeleton can be compared with corresponding bones in a monkey, bat, or seal. So it is with his muscles, nerves, blood-vessels, and internal viscera. The brain, the most important of all the organs, follows the same law, as shown by Huxley and other anatomists. Bischoff, who is a hostile witness, admits that every chief fissure and fold in the brain of man has its analogy in that of the Orang; but he adds that at no period of development do their brains perfectly agree; nor could this be expected, for otherwise their mental powers would have been the same." And now Dr. Tyson, after comparing all the bones in man's skeleton with the corresponding bones in his monkey, and following the same process with the muscles, nerves, blood-vessels, and internal viscera, comes also to the organ of intelligence, regarding which he observes, "From what is generally received, viz. That the *Brain* is reputed the more immediate Seat of the *Soul* itself; one would be apt to think that since there is so great a disparity between the *Soul* of a *Man* and a *Brute*, the *Organ* likewise in which 'tis placed should be very different, too. Yet by comparing the *Brain* of our *Pygmie* with that of a *Man;* and, with the greatest exactness, observing each Part in both; it was very surprising to me to find so great a resemblance of the one to the other, that nothing could be more. So that when I am describing the *Brain* of our *Pygmie*, you may justly suspect I am describing that of a Man, or may think that I might very well omit it wholly, by referring you to the accounts already given of the *Anatomy* of an *Humane Brain*, for that will indifferently serve for our *Pygmie*, by allowing only for the magnitude of the Parts in *Man*. . . . Since therefore in all respects the *Brain* of our *Pygmie* does so exactly resemble a *Man's*, I might here make the same Reflection the *Parisians* did upon the *Organs* of *Speech, That there is no reason to think, that Agents do perform such and such Actions, because they are found with Organs proper thereunto;* for then our *Pygmie* might be really a *Man*. . . . But those *Nobler Faculties* in the *Mind* of *Man* must certainly have a *higher Principle;* and *Matter organized* could never produce them; for why else, where the *Organ* is the same, should not the *Actions* be the same too; and if all depended on the Organ, not only our Pygmie, but other Brutes likewise, would be too near akin to us."

CHARLES F. COX.

New York, April 2.

Temperature of the Saco River.

THE monthly mean in the table is based on daily observations of the temperature of the running water at Saco, Me., at the head of the lower falls, about four miles from the mouth of the river. This river is about one hundred miles in length, and has its source in the Notch of the White Mountains of New Hampshire. Flowing nearly in a south-easterly direction, it reaches the sea in latitude 43° 27′, the total fall being about 1,900 feet.

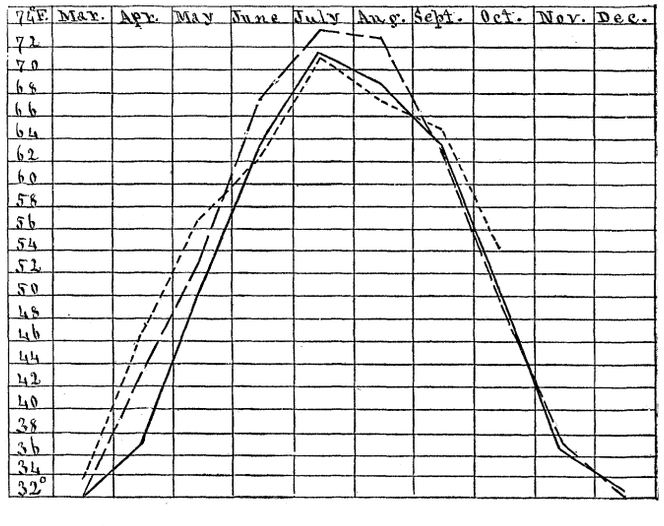
On the 9th of December, 1837, nearly the whole of the water was stopped during the night by anchor-ice, which gradually disappeared, and the full flow of the river was restored at about eleven o'clock A.M.

MEAN MONTHLY TEMPERATURE.

Year.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1837	32.00°	32.00°	32.00°	36.63°	50.19°	63.77°	71.39°	68.97°	63.53°	49.87°	36.57°	32.39°
1838	32.00	32.00	32.00	43.07	53.26	67.60	73.45	72.71	63.20	49.81	36.87	32.00
1839	32.00	32.00	33.52	46.23	56.78	62.53	71.40	67.42	64.80	54.32		

(No observations were made in November and December, 1839).

Year.	Maximum.		Minimum.		Range.
1837	July 19	73°	Dec. 9	32°	41°
1838	" 31	76	Nov. 25	32	44
1839	" 29	76	Dec. 18	32	44



1837, SOLID LINE; 1838, BROKEN LINE; 1839, DOTTED LINE.

At a recent meeting of the British Association it was decided that observations be made on the temperature of the rivers and lakes of Great Britain. The results thus obtained will be of great value, and will depend on a great variety of causes, among which are the time of exposure to sunlight, the temperature of the earth and the air, the cooling effect of evaporation, the barometric pressure with reference to evaporation, also the effect of the wind in its direction and force, the rapid or gradual melting of snow in the valleys, the turbid or clear condition of the water as to its effect on surface radiation, the exposure of the water to the air at falls and rapids, and the length of time that the surface is covered with ice.

JOHN M. BATCHELDER.

Cambridge, Mass., March 9.