or other constructions in tidal waters built during the years 1918, 1919, or even 1917. As the examination for sex can be conducted with speed only during the breeding season, which may shortly end in some localities, it is hoped that anyone knowing of suitable constructions will inform the writer at the address given below.

Evidence of sex-change is apparently already available from Gemmill's observations,[3] made so long ago as 1896. Gemmill found that 3 specimens out of 250 examined by him were hermaphrodite. In the samples quoted above no definite hermaphrodite forms were found, but several were suspected and preserved for microscopic examination. These forms were, however, mainly male or female, and are recorded above tentatively as males and females respectively. Sex-change may be seasonal, as is indeed indicated by Russell's observations on the sex of the common limpet.[4]

The sex-phenomena in the common limpet closely resemble in most respects those found in the slipper limpet, where the small females and large males are accounted for, but in which all the tiny ones—some thousands of which have now been examined—have a penis. It is, however, not impossible, on the evidence available at the moment, that sexual dimorphism without sex-change may explain the phenomena in the common limpet, but this explanation does not seem probable. The observations on the sex of the common limpet cannot all be described here; they will be continued and completed and the results published in the Journal of the Marine Biological Association, Plymouth. Fig. 1 shows a length-sex analysis of the sample of small limpets under 1 in. in length collected at Plymouth.

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A Tribute from Prague.

PERMIT me to congratulate you upon the jubilee issue of November 6, which has just reached me and has been received with great pleasure, for the last number of NATURE which reached me before this was that of July 30, 1914!

It may interest readers of NATURE to learn that from that date the Austrian Government prohibited for more than four years the circulation of anything printed in England as a punishment for the regard which, especially during the war, we have always had for your country, to which, with the other Allies, we owe our liberty. To the bodily sufferings of the war was added isolation from nearly the whole civilised world.

In a year's time I shall celebrate the fortieth anniversary of my introduction to NATURE, for while a student of Owens College, Manchester, I purchased in October, 1880, my first copy of the journal, and since that time I have been an ardent reader, contributor, and even Bohemian correspondent. The reading of NATURE's all-round scientific contents has been one of the greatest pleasures of my life in my leisure hours, and the richness of information which I have gathered from it cannot be expressed in better words than those of Dr. Deslandres in the jubilee number. I do not wonder that all attempts at founding a similar scientific and yet popular (in its best sense) journal in other European countries have invariably failed, for there a man of science is usually identical with a professor (a professional worker); and though I am one myself, yet I am of the opinion that the scientific character of NATURE is in no small measure due to the high type of British scientific amateur or student of science for its own sake, which I do not find equalled in any other country in the world.

Even we scientific workers in this remote part of Europe owe sincere thanks to Sir Norman Lockyer, who is a brilliant representative of the "non-professional" English man of science, for providing us with NATURE and conducting it so admirably for so many years.

BOHUSLAV BRAUNER.
Chemical Laboratory, Bohemian University,
Prague, November 17.

EINSTEIN'S RELATIVITY THEORY OF GRAVITATION.[1]

II.—THE NATURE OF THE THEORY.

IN the first article an attempt was made to show the roads which led to Einstein's adventure of thought. On the physical side briefly it was this. Newton associated gravitation definitely with mass. Electromagnetic theory showed that the mass of a body is not a definite and invariable quantity inherent in matter alone. The energy of light and heat certainly has inertia. Is it, then, also susceptible to gravitation, and, if so, exactly in what manner? The very precise experiments of Eötvös rather indicated that the mass of a body, as indicated by its inertia, is the same as that which is affected by gravitation.

Also, how must the expression of Newton's law of gravitation be modified to meet the new view of mass? How, also, must the electromagnetic theory and the related pre-war relativity be adapted to allow of the effect of gravitation? With the relaxation of the stipulation that the velocity of light shall be constant, will the principle of relativity become more general and acceptable to the philosophic doctrine of relativity, or will it, on the other hand, become completely impossible?

One point arises immediately. The out-and-out relativist will not admit an absolute measure of acceleration any more than of velocity. The effect, however, of an accelerated motion is to produce an apparent change in gravitation; the measure of gravitation at any place must therefore be a relative quantity depending upon the choice which the observer makes as to the way in which he will measure velocities and accelerations. This is one of Einstein's fundamental points. It has been customary in expositions of mechanics to distinguish between so-called "centrifugal force" and "gravitational force." The former is said to be fictitious, being simply a manifestation of the desire of a body to travel uniformly in a straight line. On the other hand, gravitation has been called a real force because associated with a cause external to the body on which it acts.

Einstein asks us to consider the result of supposing that the distinction is not essential. This was his so-called "principle of equivalence." It led at once to the idea of a ray of light being deviated as it passes through a field of gravitational force. An observer near the surface of the

[3] "On Some Cases of Hermaphroditism in the Limpet (Patella), with Observations regarding the Influence of Nutrition on Sex in the Limpet." By G. F. Gemmill. *Anat. Anzeiger*, xii., pp. 302–91, 1896.

[4] "On the Shell-growth of the Limpet (*Patella vulgata*)." By E. S. Russell. Proc. Zool. Soc., 1909 (1), p. 236.

[1] The first article appeared in NATURE of December 4