further confirmed by Dr. C. Häussermann last year, who has isolated a definite crystallised sodium perchromate, as described in the *Journal für Praktische Chemie*, quoted in NATURE in the notes given July 27, 1893, p. 300. THOMAS FAIRLEY.

Cataloguing Scientific Papers.

THE recent circular issued by the Royal Society anent the indexing of scientific literature affords me a pretext for suggesting in your columns a reform which I have long thought to be urgently required. It is that henceforward all scientific publications should be issued in only one volume per annum—in parts, if necessary, but consecutively paged and with only one index—and that this volume should be primarily referred to by the year of its publication, *not* by its number since the first issue of the publication. Two advantages would accrue from this system. In the first place, the date of all quoted work would be fixed; in the second place, the finding of the abstracts of papers published elsewhere, printed in the journals of scientific societies, would be rendered more easy. A little reflection will show that these benefits are not trivial. For example, suppose an author refers to a paper by Smith published in NATURE, vol. xi. I have not (may I be pardoned for saying so!) the slightest idea when NATURE was first issued, nor do I remember whether one or two volumes of this periodical appear per annum. I am therefore totally in the dark as to whether Smith's work is one year old or twenty years old, and consequently I am ignorant whether he is likely to have used the most modern appliances in his research, and whether he is likely to have been contradicted by subsequent observers. Again, I am referred by an author to a paper by Schmidt, in the *Berichte* of the German Chemical Society, vol. xx. Not possessing this journal, I hope to be able to find an abstract of the paper in question in the *Journal* of the Chemical Society, to which I subscribe; but as I have no notion in what year vol. xx. of this *Berichte* was published, I have to search through numerous indexes in order to find the abstract. A search for previously published work is already sufficiently difficult to cause many to shrink from the task; ten years hence it may be expected to be the most laborious and thankless work which the investigator has to perform. A. G. BLOXAM.

May 19.

Clavatella Prolifera.

THIS hydrozoan may be added to the list of the Jersey marine fauna. It occurs in rock pools on the higher littoral between the Point des Pas and Gorey, and probably at other places round the coast. I often found three or four colonies in one small pool; but the number of polypites in a colony was very small—generally two or three, rarely four, and only in one case five. The stolon runs along in the chinks of the Melobesia that grows over so many of the pools, hence it is not an easy matter to obtain specimens there. The walking-buds, however, were fairly plentiful.

May I ask if any correspondent of NATURE has ever seen the walking-bud of *Eleutheria*, in which both extremities of the bifurcated arms are said to consist of a ball of thread-cells?

May 22. HENRY SCHERREN.

THE DESTRUCTIVE EFFECTS OF SMALL PROJECTILES.[1]

THE effects of small projectiles when driven at high velocity through the tissues of the brain have always excited the deepest interest, for very obvious reasons.

This interest must always be two-sided, namely: (1) Physical; (2) Pathological; and it is upon these two points of view that I propose to speak to you this evening.

Conceive a cylindrical bullet with a conical head flying through the air some ten or fifteen times faster than an express train.

We have now to study what it is doing in its aerial flight, and what will happen when that terminates by the projectile striking both hard and soft substances.

This embodies matter for the purely physical side of the work.

But imagine, further, that the hard and soft substances just mentioned are the skull and brain respectively, what will happen then?

This is the pathological part of the question, and it is one of the greatest moment; for whereas it is true that a few persons do survive being shot in the head, the large majority die; and it is my object to show you how a combination of physical and pathological experiments has revealed the reason why the majority do die, and revealed it, fortunately, so distinctly as to suggest means for warding off the fatal result.

(1) *Physical Considerations.*—First take the case of a bullet flying through the atmosphere. Here in this extremely beautiful photograph, kindly lent me by Prof. Boys, you observe that the bullet drives before it a wave of compressed air. Now this compressed air-wave is what is popularly called the wind of the shot, and to it used to be ascribed by military surgeons a certain proportion of deaths. The origin of this theory is difficult to discover, as the only case I am aware of in which the *post mortem* examination did not reveal hæmorrhage, fracture, &c. indicating that the shot had actually struck the body (though without injuring the highly elastic skin) is the instance given by the great Russian military surgeon Pirogoff, in his interesting surgical experiences of the Crimean war. Even this instance finds *à priori* a more reasonable explanation in syncope, and we shall see directly that the wind of the shot not only cannot, under any circumstances, kill a man, but also that its energy is far too slight for it to have any destructive effect whatever. It is rather curious to find that but few attempts have been made directly to estimate the wind of the shot, and those by Pelikan and others are only for large shot and by too coarse methods to be applicable in the case of a bullet, as the following experiment shows.

An extremely light vane of paper carrying a delicate mirror is suspended to a cocoon fibre, and carefully protected from currents of air in the room. A very gentle puff causes the vane to fly out most vigorously, yet we shall find that the ·380 bullet moving a thousand feet a second may pass within eight inches of it without causing the least deviation of a ray of light reflected from the mirror. It is only when the bullet passes within an inch or two of the edge of the vane that there is some slight rotation. The ·303 magazine service rifle, with a velocity of twice that of the larger bullet, produces little more than the same result. It is therefore obvious in this case that the far higher velocity is more than compensated for by the lesser sectional area of the projectile displacing the air. Although there was no proof of much displacement of the air, it was pretty generally held that when the bullet entered any substance the compressed air driven before it exercised an explosive effect. This opinion was more particularly supported by the Belgian physicist Melsens, who actually described it by the term "projectile air." The matter was taken up from the point of view of pure physics, and Magnus demonstrated that if a body like a bullet entered water, *e.g.* in falling the funnel which the displaced water makes in the axis of the body as soon as that is fully immersed, entangles air, and that it is this air which is carried by the body into the fluid, rather than that any air is forced in in front of the bullet. In answer to Magnus, Laroque invented the following ingenious experiment. He allowed a long body, incapable of wholly sinking, to drop into the water, and then found that there was air driven in in front of it; while, by the nature of the experiment, he had, of course, excluded the possibility of any air following the base of the projectile. I have repeated all these experiments (employing in Laroque's a slender rod of wood) and found that while his contention that air is driven in front of the bullet is completely substantiated, yet Magnus' observation is so far correct that air is also

[1] A lecture delivered at the Royal Institution on April 6, by Prof. Victor Horsley, F.R.S.