Mr. T. C. Hepworth and Mr. W. T. Bashford trace the history and describe carefully the various processes of photography. Mr. J. S. Keltie has an excellent article on Polar exploration, illustrated with a North Polar and a South Polar chart. A short but very good paper on protoplasm is contributed by Mr. J. A. Thomson; and Prof. Sorley makes the most of the few pages set apart for psychology. Rain is discussed admirably by Dr. Buchan, and the rainbow by Mr. W. T. Omond. Reflection and refraction are dealt with by Dr. Alfred Daniell. The main facts relating to the Red Sea are presented by Dr. John Murray; and Dr. Hugh R. Mill sets down all that is likely to be wanted by students who have occasion to refer to the article "River." Altogether, the various papers we have examined may be commended as in every way worthy of the high reputation secured for the present edition by preceding volumes.

La Place de l'Homme dans la Nature. By T. H. Huxley. (Paris: B. B. Baillière et Fils, 1891.)

MORE than twenty years ago a French translation of Prof. Huxley's well-known work, "Man's Place in Nature," was published. The translator was Dr. E. Dally. In the present volume this rendering is reissued, and along with it are associated translations of three papers in which Prof. Huxley has presented his ideas on various ethnological subjects. These papers have been translated by Dr. Henry de Varigny, to whom Prof. Huxley expresses thanks for the care he has taken to represent clearly and faithfully the meaning of the original. The volume will be very welcome to French students who desire to understand the methods and tendencies of English scientific thought.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Smithsonian Standards for Physical Apparatus.

ON the occasion of a scientific expedition of which I had charge many years ago, the need of common standards of size for the parts of different astronomical and physical instruments was brought forcibly to mind; for the instruments used, while of the latest and best construction, were necessarily dismembered, and then transported in fragments to their scarcely accessible destination by numerous independent bearers; and if any accident happened to any fragment of any piece of apparatus, it was found, as a rule, that the whole was rendered useless, since it could not be replaced from the like parts of other pieces which were spared. The weapons of attack of the little scientific force were, then, in one important respect, far inferior to those of modern warfare, in that there had been no attempt to make their parts interchangeable.

My attention having been drawn to the matter, I was led to examine astronomical and physical instruments in all cabinets accessible to me, with a special view to this feature. I found that, as a rule, no draw-tube, screw, or other piece from one instrument would fit the corresponding parts in any other, there being no attempt to make them interchangeable even where they came from the same maker.

This experience must be confirmed by that of most others, who will probably agree that this is a cause of incessant, but quite avoidable, loss and delay, even where apparatus is used under ordinary conditions, and it has led to inquiry for some scheme which would assimilate different parts of the work, not only of the same, but of different makers. Some of the plans suggested are well matured, and in themselves apparently commendable, but all are too complex, the ambition of the authors being, as a rule, to make them so complete as to cover all possible demands of future progress.

What has been wanted by many others doubtless is some simple and practicable plan for *immediate* use, which shall yet be found in accord with the larger scheme which may be under consideration hereafter.

When it fell to me to meet the somewhat varied wants of the Smithsonian Institution by a plan which should at least enable a beginning to be made in the right direction, it seemed that this should be with such simple and general conditions, that common consent to them might almost be counted on, at least on the part of all ready to use the metrical standards.

To provide for the immediate practical wants of this Institution, advice was sought of several of the best instrument makers, and a considerable number of tubes and screws by English, French, and German, as well as American makers were examined to find out the sizes which long-established use in these countries had shown to be practically convenient, and the forms of screws which the best modern practice of scientific instrument makers concurred in; and this having been done, dimensions having a metrical unit, and as near these sizes as practicable, were adopted—not as a finality, but as a beginning.

In the hope that others may consider this very modest attempt to be in the right direction, and that these standards may fall into use for immediate needs, and thus tend to bring about the adoption of that much more complete system of international standards which most will admit to be (at least in the abstract) desirable, I beg leave to inclose a circular which has been sent to all instrument makers employed by this Institution, trusting that you may find it of sufficient interest to bring it to the attention of the readers of NATURE.

S. P. LANGLEY,
Secretary.

Smithsonian Institution, Washington, D.C., December 16.

Circular to Instrument Makers.

In all apparatus used by the Smithsonian Institution a series of standard sizes for metal tubes and for the screws chased on them has been adopted. The metric division is employed, and all tubes ordered are to be finished to some even number of half centimetres in diameter, unless this cannot be done without great difficulty. The series of diameters and corresponding threads to be used is, for a diameter of

10	centimetres,	5	threads	to a	centimetre.
9	,,	5	,,	,,	,,
7·5	,,	7	,,	,,	,,
6	,,	7	,,	,,	,,
4·5	,,	10	,,	,,	,,
3	,,	15	,,	,,	,,

When any new tube has to be ordered, it should be made one of these diameters and chased with one of these threads, if this can in any way be done.

New eye-pieces are to be as far as possible made to fit the three-centimetre plug gauge supplied by Pratt and Whitney, and in fitting them to old work, this size is still to be adapted wherever possible. The Institution is preparing standard plugs and gauges of the diameters given above, and has on hand chases of 5, 7, 10, and 15 threads to the centimetre. All screws have the 60° thread, with flattened top and bottom. These it will supply at first cost to any instrument maker engaged in its work.

Plug gauges are to be had of great accuracy and at moderate cost from several standard tool makers. Those here referred to have been made for the Smithsonian Institution by the Pratt and Whitney Company of Hartford, Connecticut, and are within a limit of error of two-hundred-thousandths of an inch at 62° Fahrenheit. The hobs are from the same makers.

Pigment in Yellow Butterflies.

Apropos of the interesting discussion on comparative palatability and warning colours (NATURE, November 19, p. 53; November 26, p. 78), it may be of interest to your readers if I restate in your columns some of the properties of the yellow pigment contained in the wings of the common brimstone and many other butterflies; the possible significance of which in conferring protective unpalatability is suggested by Mr. Beddard. My paper on the subject, to which Mr. Beddard refers, was read before the Chemical Society in June 1889; but, being more or less of a preliminary nature, it was published only in the abstracts of that Society's proceedings (Abst. Proc. Chem. Soc., vol. v., 1889, p. 117; *vide* also NATURE, vol. xl. p. 335).

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