SCIENCE:

PUBLISHED BY N. D. C. HODGES, 874 BROADWAY, NEW YORK.

SUBSCRIPTIONS.—United States and Canada.....$3.50 a year.
Great Britain and Europe..... 4.50 a year.

To any contributor, on request in advance, one hundred copies of the issue containing his article will be sent without charge. More copies will be supplied at about cost, also if ordered in advance. Reprints are not supplied, as for obvious reasons we desire to circulate as many copies of *Science* as possible. Authors are, however, at perfect liberty to have their articles reprinted elsewhere. For illustrations, drawings in black and white suitable for photo-engraving should be supplied by the contributor. Rejected manuscripts will be returned to the authors only when the requisite amount of postage accompanies the manuscript. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guaranty of good faith. We do not hold ourselves responsible for any view or opinions expressed in the communications of our correspondents.

Attention is called to the "Wants" column. It is invaluable to those who use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

[*Numerous complaints reach us of delay in receiving "Science" through the mails. It appears that it frequently takes a week for the paper to reach Illinois, for instance. This is owing to the small allowance of funds to the New York Post-Office, which prevents the employment of a sufficient force and compels the present force to work in decidedly over-crowded quarters.*]

THE PEDIGREE OF THE LETTER Y.

BY CANON ISAAC TAYLOR, LITT.D., YORK, ENGLAND.

IT is commonly asserted that our letter *y* is the lineal descendant of the Roman Y, which in the time of Cicero was borrowed from the Greek alphabet to represent *upsilon* in the transliteration of Greek names. This, however, is a mistake, as will be seen by tracing the history of the letter. It is only when *y* is used, as the Romans used it, as a vowel to transliterate *upsilon* in loan-words (either direct from the Greek or indirectly through Latin or French), such as *hyperbola*, *hydrostatics*, *hypocrite*, *tyrant*, or *myrtle*, that our *y* represents the Roman Y and the Greek *upsilon*. In the great majority of cases the English *y* is a semi-consonant corresponding in value to the Continental *j*, as in *young*, *yea*, *year*, *Yenisei*, *Yakut*, which in German are spelt *jung*, *ja*, *jahr*, *Jenisei*, *Jakut*. Along with the other Roman letters, the letter Y was adopted by the Anglo-Saxons from the Latin alphabet, with a value approximating to that of *i*, and hence the *y* in Anglo Saxon words has usually become *i* in modern English, or has lapsed into the neutral vowel, as in the words, *fyr*, *fyst*, *hyd*, *hyf*, *bryeg*, *ynce*, *hyll*, *flyht*, *yfel*, and *wyrm*, which are now written *fire*, *fist*, *hide*, *hive*, *bridge*, *inch*, *hill*, *flight*, *evil*, and *worm*. In fact, there is not a single lineal descendant of the Anglo-Saxon *y* now in existence. The letter *y* in modern English words is, curiously enough, not a *y* at all, but a lineal descendant of the Anglo-Saxon *g*, which was the Roman G, evolved by the Romans out of an earlier C. This Anglo-Saxon *g* split into two sounds, retaining the old hard sound before or after the back vowels *a*, *o*, and *u*, as in *go*, *dog*, *gold*, *gum*, while before or after the front vowels *e* and *i* it weakened into a palatal semi-vowel; the words *ge*, *gese*, *gea*, *git*, and *gear*, becoming *ye*, *yes*, *yea*, *yet*, and *year*. A symbol which has acquired two values is frequently differentiated into two forms, thus *i* and *j*, *u* and *v* have come to denote respectively the vocalic and semi-consonantal sounds of the same primitive symbol. This happened with the values of *g*. The Anglo-Saxon form ȝ came to be appropriated for the weakened sound, and the Caroline or Continental form *g* was used for the original stopped sound. In Middle English MSS., we have the two forms side by side, written ȝ and *g*. At the time of the invention of printing, this weakened *g*, written ȝ, had become almost identical in form with *y*, and accordingly printers used *y* to express it, while in Scotland a *z* in black letter (ȝ) was used for the weakened *g*, and in old Scotch books we fine *yet* printed as *zit*, and *year* as *zeir*, not that these words were pronounced with a *z*, but *z* was used for ȝ, as *y* was in England; just we write *viz* for *videlicet*, where the *z* is not the sibilant, but merely an old ligature for *et*, *videlicet* being formerly written *videlicȝ*, in the same way as *libet* was written *libȝ*. So also the final *y*, so common in English words, is really the descendant of the final *ig*, equally common in Anglo-Saxon; *many*, *busy*, *any*, *greedy*, *silly*, *honey*, *holy*, and *day* being the Anglo-Saxon words *manig*, *bysig*, *ænig*, *grædig*, *sælig*, *honig*, *halig*, and *dæg*. This final *y* is so common a termination in English that, owing to analogy, it has replaced the old termination *ie* in other words, as in *academy*, *anatomy*, *homily*, and *irony*, where it represents the Greek *ia*, or in *jolly* and *tardy*, where it represents the French *if*. In *by* and *my* it has been introduced from analogy with words such as *dry*, *fly*, *sky*, where the *y* is really the weakened *g*. It will be objected that in certain words, such as "young" and "yard," an Anglo-Saxon *g* has become *y* before back vowels, but this fact is really only a confirmation of the rule, as in such cases the front vowel which modified the *g* has been lost, "young" being from the Anglo-Saxon *geong*, and "yard" from *geard*.

In the neo-Latin languages the same weakening of *g* before front vowels took place, but duplicate forms of the letter not being available to denote the two sounds, *g* represents both sounds, as in the case of the Italial words *gente* and *gallo*, or the French *géant* and *gôut*, or else the *g* was replaced by *j*, as in *jouir*, from the Latin *gaudere*.

INSTINCT.

BY C. F. AMERY.

IT is now universally recognized that animals possess intelligence. The evidences on this head are too patent for dispute; but, like the guinea of the Primrose girls, it is supposed to be employed only in extraordinary emergencies. All the text-books on comparative psychology assume that all the ordinary pursuits of animals are instinctive, by which is implied automatic and mechanical; but whether instincts are to be regarded as impulses or as guides to action, or whether the activities are themselves instincts, is nowhere clearly defined in the text-books I have consulted. I purpose, in the present paper, to define the nature of instinct, and to indicate its place and the importance of its functions in the general economy of animal life.

The only satisfactory course of procedure is, first to collect and array the facts, and as man himself presents abundant illustration of all the psychological activities exercised in the animal kingdom, we cannot do better than examine the facts and study the nature and functions of instinct as exemplified in our own persons.

What then is instinct?

All the functions of the human organism and all the activities of life are classifiable under three heads — the mechanical, the reflex, and the intelligent.

The mechanical are the fundamental continuous processes of digestion, assimilation, circulation, secretion, and respiration. All these processes are performed unconsciously and involuntarily excepting respiration, which is performed sub-consciously and is to a small extent under the control of the will.

The reflex activities are automatic responses of the neuro-muscular organism to the stimulus sensations. They begin and end in the organism. In man, as in other animals, they are due to secretions in the system, to contact with external objects, or to special periodical or occasional conditions of the organism. They are all performed consciously by man, and are all susceptible of being brought more or less under the control of the will. The most common reflex activities are laughing, crying, sucking, masticating, swallowing, voiding the fœces and urine, coughing, sneezing, withdrawal from contact with objects, purposeless bodily exercise, etc. Laughing and crying may result from sensation, but they are sometimes reflex activities of the brain, originating in ideas.

Intelligent activities result from the perception of objects, their properties, and relations. Every effort for adjustment of the organism to external conditions apprehended through the senses is