

from 3,697 at Naples to 87 at Milan. The percentage of medical students to the population is about 61 per 100,000 inhabitants. In France it is 57 per 100,000, and in Germany 63 per 100,000.

THE Cambridge University Calendar for the academical year 1895-6 gives as the total number of undergraduate students 2,895, an increase of 56 compared with last year.

MISS HELEN GOULD has founded two scholarships of \$5,000 each in the University of the City of New York.

MRS. FRASER, widow of the late Bishop of Manchester, has bequeathed £3,000 to Oriel College, Oxford, for the foundation of a scholarship; and also £3,000 to Owens College, Manchester, towards the endowment of a chair of ecclesiastical history.

DR. LINGI PALAZZO, of Officio Centrale di Meteorologia e di Geodinamica, Rome, has been made a professor.

DR. BEHREND, of Leipzig, has been called to the chair of chemistry in the Technical High School of Hanover, and Dr. Roher to an assistant professorship in the University of Prague.

It is stated that Dr. Nathaniel Butler, of Chicago University, has declined the presidency of Colby University.

PROF. W. S. STRONG, of the University of Colorado, has accepted a professorship of physics and geology in Bates College.

THE will of the late Benjamin P. Cheney bequeathes \$10,000 to the Massachusetts Institute of Technology.

THE Catholic University has decided to admit women to lectures in the regular and special courses.

It is stated that the Hon. Carroll D. Wright will give a course of lectures on political economy during the coming winter in the McManon Hall of Philosophy of the Catholic University.

CORRESPONDENCE.

ARE CONSEQUENCES EVER A TEST OF TRUTH?

I AM glad that Professor Cattell (*SCIENCE*, N. S., II., p. 271-2) has taken me at my word in regard to criticisms of recent articles; even though I may be the first to suffer. In my recent article in the *Monist* I had spoken of evil consequences as a reason for rejecting the view that natural selection is the only factor in social evolution. On this Professor Cattell remarks: "But even if these practical consequences follow, one is surely not justified in arguing that facts do not exist because we would gladly have them otherwise."

Now I admit that Professor Cattell may be right from a scientific point of view, but not, I think, from the widest philosophic point of view. This opens a very wide question, but hardly adapted to a scientific journal. I can, therefore, touch it very lightly and only in the way of barest suggestion; and even so I fear I shall raise more questions than I solve.

It is indeed true that many things which we, from the point of view of *the now and the self*, would gladly have otherwise are nevertheless true; yet I do not think that a doctrine or idea which, if carried out, would be disastrous to humanity *as a whole* and in *the final outcome* can be true. If it were, then our intellectual and moral natures would be in hopeless conflict and we ourselves in a state of irretrievable confusion.

Or put it in another way: There are certain postulates which are a necessary condition of our effective activity in this world. We cannot prove them; we assume them because necessary to our activity. We assume the existence of the external world as a necessary condition of *physical* activity. We assume a rational order of the universe—a universal reign of law—as a necessary condition of scientific activity. We may not be able in a particular case to see law and rational order; on the contrary, all may seem chaos and confusion, but we are sure that this seeming chaos is the result of our ignorance and that behind it is perfect order. So, also, there are postulates of our *moral nature*, postulates because absolutely necessary conditions of our *moral* activity. Such a postulate is the existence of a universal *moral order*—a perfect

righteousness—behind all seeming moral disorder and evil. I repeat, then, that whatever is a necessary condition of our highest activity—whatever is contributive to the best interests of our *whole* humanity and in the *final outcome*—must be in some sense true. I am quite aware that we are often mistaken as to what ideas come under this head, but we are mistaken only through a too limited and personal view.

Therefore, in a true philosophy, we cannot wholly leave out consequences. It would be irrational to do so. "But observe; I speak of consequences only as a *test* of truth. I would not swerve a hair's breadth in absolute devotion to truth. Whatever is really true will surely vindicate itself as such by its beneficence, if we only wait patiently for final results."*

So much for the principle criticised. Nevertheless, I freely admit that I may be wrong in thinking that these dire consequences would follow if natural selection be the only factor in social evolution. There may be, and indeed I am sure there is, a natural selection of fittest ideas and institutions, and thereby a gradual improvement of the social environment, which must be a powerful factor of progress, and of which I did not take sufficient account.† But to show that I have not been wholly unmindful of this factor I quote from a recent paper:‡ "Ideas are like species. In the evolution of thought, some indeed become extinct and have no progeny, but some are transformed into new, and all the new come only by such transformation of the old."

JOSEPH LE CONTE.

BERKELEY, CAL.

THE KATYDID'S ORCHESTRA.

TO THE EDITOR OF SCIENCE: Possibly the phenomenon I am about to describe is well known to biologists, but to me it is unknown, and it seems so remarkable that it is worth recording. It is the only instance I know of in nature of any continued attempt at concerted harmony and measured time-keeping on the part of many animals. With all the musical or sound-mak-

ing capacities of animals none seems to have much of an idea of measured time-beating, and in no instance known to me is there any attempt of large numbers to unite the individual notes into a common musical result. The universal fact of preserved individualism, and indifference to unisonal effect, is a noteworthy one when we consider the high degree of musical sense with which some animals are endowed.

Probably every person would express disgust at the idea of the stridulous noise of the Katydid being musical, and surprise at the suggestion that there is any rhythm or unison in many of them, but for weeks the fact has been all too apparent to my family for the purposes of sleep. Our house has been upon a mountain top in North Carolina, surrounded by a grove of trees, and farther away by woods upon all sides. So soon as the sun has set and twilight is advancing, the katydids in the trees begin to 'tune up.' The first notes are scattered, awkward, and without rhythm, but if no wind is blowing, thousands soon join in and from that time until daylight breaks there is no intermission. It is marvellous that the organs can withstand this continual rubbing for eight hours. By choosing out an insect close by and listening to it alone I have convinced myself that the same insect keeps at it at least for hours at a time. These raspings are seldom three at a time, as the popular name would imply, but are the result of usually four or five, sometimes six, distinct but closely joined movements. When united with a thousand others the disjunction of these tones is, of course, not perceptible, and they sound like a single note. In order to make my description clearer, let us suppose one thousand Katydids scattered through the trees to utter their several notes all at once, and call them Company A. Another thousand, Company B., at once answers them, and this swing-swing is kept up, as I say, all night. Company A's note is the emphatic or accented note, and is more definitely and accurately a precise musical note, whilst the note of Company B varies from one to five half tones below, the most conspicuous note being five. In the old-fashioned musical terms I learned as a boy, Company B's note is *e. g.*, clearly and definitely *do*, while the note of Company B is either *la*, or more cer-

* 'Evolution and its relation to religious thought,' p. 279.

† Geol. Dep't, University of California, Bull. No. 11, p. 336.