

heat to the cylinder wall to check that initial loss. It has no thermodynamic value, in a proper sense, as it does not increase the range of adiabatic expansion. The economical value of superheating and of 'reheating' between the cylinders of the multiple-cylinder engine was discussed, and illustrations were given from the reported results of engine trials, showing that superheating is more effective than other expedients for the prevention of internal waste. By reference to experiments reported in large numbers on the value of heat transferred to the steam by steam-jackets for the same purpose, the conclusion was drawn that for each unit of heat expended in the prevention of this waste several could usually be saved in the engine. For simple engines this ratio of saving to expense amounted to an average of six and seven; for compound engines, to between three and four, the gain being the less as the engine is the more economical originally. Experience in Europe, far more than in the United States, affords fact and datum for the conclusions reached. The Schmidt superheating engine, reported upon by Schroeter, of Munich, gives the horse power on but 10.2 pounds of steam per hour; the pressure being about 125 pounds and the engine one of moderate size. The little twenty-horse-power engine of Sibley College, operated with 300 to 500 pounds of steam, as elsewhere described, is here stated to give the horse-power, the steam being saturated at the high-pressure cylinder and reheated between cylinders with 'less than ten pounds, 11,000 B. T. U., per horse power per hour.' The conclusion is reached that "This is, to-day, the greatest of all the problems presented to the designing and constructing engineer, with the possible exception of that of finding a system of effectually rendering the interior of the working cylinder non-conducting in such manner as to entirely prevent the occurrence of initial condensation; thus conforming the 'ideal case'

to the real, and making the steam engine a purely thermodynamic machine."

A number of papers were read describing details of practical engineering work and a set of 'topical questions' was propounded; both papers and questions eliciting much interesting discussion bearing upon practical, rather than scientific, points in engineering.

CURRENT NOTES ON ANTHROPOLOGY.

THE SCIENCE OF LANGUAGE.

WITHIN the compass of about 300 duodecimo pages, Prof. Giacomo de Gregorio, of the University of Palermo, has compressed an admirable survey of the elements of the science of language, a task by no means easy. ('Glottologia.' Ulric Hoepli, Milan, 1896.)

He divides the subject into three parts, glottology, language in general, and particular languages. In the first he discusses the place of the study of language among the sciences, and rapidly sketches its historic development, naming the most prominent students and their works. The second part enters fully into the phonetics and the physiology of articulate sounds, and in a second chapter reviews the theories of linguistic radicals and the origin of speech. The third part presents an able chapter on the various proposed classifications of languages, and a summary of the principal linguistic stocks of the globe. An excellent bibliography of linguistic writings precedes the text.

The author is much more than a compiler. He is an independent and acute critic, and threads his way with clear vision through the dust and fog of conflicting hypotheses and averments. He is not a supporter of any 'school,' but claims for linguistic science the high and right place that it deserves among the natural sciences relating to man, and his method is that of those sciences.

ETHNOLOGY AND HISTORY.

WHEN the science of ethnology shall be properly understood, the application of its methods to the sociologic development of the human race will lead to an entirely novel plan of writing history, and to a different appreciation both of its motives and its aims. That which has long been sought for under the attractive name of 'The Philosophy of History' will be found to be nothing more than a series of ethnologic deductions; and 'The Mission of the Historian' in its largest sense will be nothing more than the application of the natural science of man to the welfare of man; nothing more but that will be the greatest achievement which the human species will have witnessed, far transcending any mere material gains or discoveries which it has made or can make.

At the last annual meeting of the New Jersey Historical Society I delivered by request an address upon this subject, which has since been published. A limited number of copies remain by me, which I shall be glad to send to such readers of *SCIENCE* as may apply for them. (Address, Media, Penna.)

PRIMITIVE COSMIC CONCEPTIONS.

SLOWLY but surely the theory that similarities of mythical concepts betokened ancient intercommunication is giving way to the true explanation that such similarities are owing to the unity of the human mind and the sameness of its processes.

No one has taught this profound truth more positively than Prof. Bastian, the eminent director of the Ethnographic Museum of Berlin. Very lately he has published a most instructive work of about 200 pages entitled, 'The Thought Creation of the Surrounding World out of Cosmogonic Conceptions.' (Dümmler, Berlin.) It treats of the various so-called 'elements' which make up the myths of religions, the beliefs

and notions of his surroundings, real and imagined, which every man forms unconsciously to himself, and which deeply influence his life and works. Such are his views about the divine, the soul, death, spirits, creation, magic, etc. These and a hundred others develop similarly in similar stages of culture, and the parallel schemes drawn from culture-horizons far asunder which the author lays before the reader are striking and convincing.

It would be very desirable if Dr. Bastian's remarkable studies on this and allied subjects could be brought in a compact shape before the English reading public.

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NOTES UPON AGRICULTURE AND HORTICULTURE.

DISEASES OF CITROUS FRUITS IN FLORIDA.

THE orange industry is a large one in the warmer portions of our country and the citrus fruits have several diseases which cause annual losses of not less than a half million dollars. In order to obtain good control of these diseases and check their ravages the government has had a station of research in Florida for the past three years, and Bulletin 8 of the division of Vegetable Physiology and Pathology just issued is a report of progress by Messrs. Swingle and Webber at the Subtropical Laboratory. The bulletin commends itself at sight, being attractive in plates, three of which are colored, and the text is carefully prepared. Six diseases are considered, namely: (1) Blight, (2) Die-back or Exanthema, (3) Scab or Verrucosis, (4) Sooty Mould, (5) Foot-rot and (6) Melanose.

The blight, probably contagious, the cause of which is yet unknown, seems to be incurable; therefore affected trees should be burned. Die-back is due to malnutrition and improper drainage and culture. Brown eruptions appear upon the twigs