

feed-water to about half that proportion, for ratios of expansion approximating six; from one-third to about one-tenth, at a ratio of five; and apparently from twenty to ten per cent at 4.4. In this first case, also, the jacket gives best results, with 110 pounds of steam, when the ratio of expansion approximates six. When the steam pressure falls to approximately eighty pounds, the best work of the jacket occurs at a ratio not far from 4.75; while, at a pressure of fifty pounds, the value of the jacket increases through the whole range of the experiments, and not only so, but the indications are of probable improvement indefinitely in the direction of increasing expansion. The highest efficiencies, however, either with or without the jacket, are found, in this case, at the lowest ratios adopted, and indicate a maximum value at about 3.25. The ratios of expansion for maximum efficiency of fluid, in the other cases, are for 110 pounds, about five, and for eighty pounds, about 3.5. Similarly studying the performance of the condensing engine, we find that the best work is done, whether jacketed or not, at about a ratio of expansion of ten (at a steam pressure of 110 pounds), but that the jacketed engine reduces the internal wastes from fifty per cent at highest ratios, and from one-fourth at the lowest ratios, in the case of the unjacketed engine, to five per cent, and, in some cases, probably to within the magnitude of the errors of observation. At a pressure of ninety pounds the best ratio seems to be for this engine, under the given conditions of operation, about 6.5 when unjacketed, and 8.5 jacketed; while the lower pressures still further reduce both the efficiencies and the savings effected by the jacket. The best work of the jacket, as an economizer of heat, is done at high pressure, at a ratio of expansion of twelve or more. In all cases it seems to be the fact, with these engines at least, that the jacket is useful beyond the ratios of maximum efficiency of fluid. The compound engine exhibits the same general effects which have been noted in the cases of simple engines. This discovery of a maximum efficiency of jacket may throw some light upon the causes of the conflicting and sometimes apparently irreconcilable results of trials of engines with and without jackets, and with jackets variously constructed. The discovery may also prove of value to the designer, as aiding him in securing the best proportions and arrangement of his engine.

THE PREVAILING FEVERS OF CHINA.

DR. COLTMAN, writing in the *Medical Missionary Journal* upon the fevers of China, remarks, says the *Lancet*, that but little personal investigation on the subject has been made up to the present time, owing to the comparatively recent advent of foreign medical men, and to the want of confidence on the part of natives to submit for any lengthened period to the treatment of a foreign physician, or, in fact, to any one physician, their rule being to change doctors two or three times a day if they can afford it. Again, there have been but small hospital facilities for studying fevers, and there is an impossibility of obtaining post-mortem examinations. Dr. Coltman considers that small-pox is the most common disease, nearly every person suffering from it at some period of his or her life. Vaccination, although practiced, is done very carelessly. Measles appear to be common, but are somewhat milder than in Europe. Scarlet-fever, although it undoubtedly occurs among the natives, is far less common than among Europeans. Erysipelas is rare. Typhoid-fever is very difficult to diagnose in the short time that a foreign medical man is allowed to attend a case; but Dr. Coltman thinks that when more accurate reports are possible, this disease will be found to be more common among the natives than is now supposed. Typhus-fever is met with all over North China, and as far south as Shanghai. Relapsing fever is found constantly associated with typhus. Dengue does not seem to be known among natives. Cholera occurs as an epidemic every few years, and is very fatal. Diphtheria is severe, and frequently fatal among the natives. Whooping-cough has occasionally been met with. Rheumatic fever is very prevalent in some parts. Chronic muscular rheumatism is common all over China, but is unattended by fever. Malarial fevers appear to be common everywhere, though the prevailing type varies; thus, tertian is most common in Pekin, quartan in Foochow, Swatow, Shanghai, and Hangchow, and remittent in Cheefoo and Tientsin.

In Chinanfu, Dr. Coltman has never seen a case of quartan ague; it is all intermittent of the tertian or quotidian type. The treatment, of course, of all malarial fever is by quinine or some other cinchona bark alkaloid. In Hangchow the carbolic acid and iodine treatment has been used successfully as a prophylactic; arsenic is recognized as valuable in the chronic form.

NOTES AND NEWS.

THE trustees of the University of Pennsylvania have elected Dr. George A. Peirsol, professor of anatomy; Dr. Harrison Allen, professor of comparative anatomy; and Dr. John B. Deaver, assistant professor of applied anatomy.

— Mr. Emil Theilman, a graduate of the Missouri State University, has been appointed to a position as aide on the State Geological Survey.

— Professor Henry S. Munroe is to have charge of the Columbia College School of Mines' summer school of surveying at Litchfield, Conn.

— Professor J. F. Kemp of Cornell University, Ithaca, N. Y., has been appointed adjunct professor of geology at Columbia College, New York.

— The *Engineering and Mining Journal* of this city states that extensive deposits of onyx have been discovered near Marion, Smyth County, Va. Four openings are reported to have been made so far. The stone is said to be of excellent quality.

— The Marine Laboratory of the Johns Hopkins University will be open this summer at Port Antonio on the north-east coast of Jamaica. Professor Brooks and a number of members of his party have already started for the station.

— A writer in *Science Gossip* says that the philosopher Kant one day was passing a certain building in his daily walk, and on looking up, he discovered, as he fancied, that the old birds were actually throwing their young ones out of the nests. It was a season remarkable for the scarcity of insects, and the birds were apparently sacrificing some of their progeny to save the rest.

— The harbor of Salonica, says the *Scottish Geographical Magazine*, is threatened with the same fate as that which has befallen Smyrna. Owing to the alluvial deposits of the Vardar, the harbor is becoming useless as a trading port. The entrance through the sandbanks is very difficult, and the delta of the river has advanced to the neighborhood of Cape Kara-Burun. The prospective value of Salonica to Austria-Hungary may therefore be questioned.

— The recent census of Bengal, says the London *Times* correspondent, in a dispatch of March 27, throws an instructive light on the sanitary condition of the province. The districts showing a decrease in population are mainly those where defective subsoil drainage produces malaria. This is especially marked in parts of Nadiya and Jessor, and is due to the fact that the natural drainage channels have been blocked by injudicious cultivation, and the want of sufficient provision for a water-way in the construction of the railway.

— We learn from the *Scottish Geographical Magazine* that Dr. Konrad Ganzenmüller has published in the *Zeitschrift für wissenschaftliche Geographie* (Bd. viii., Heft 1) a learned and able paper illustrating his hypothesis that the Ukerewe, or Victoria Nyanza, is identical with the Eastern Nile sources of Ptolemy, with the Crocodile Lake of an unknown Greek writer, and with "Kura Kavar" of the Arabs, and that fairly accurate knowledge of the territory of the Nile sources was formerly possessed, but subsequently was lost.

— The collections of fishes made by the "Albatross" in 1887-88, at the Galapagos Islands and in Panama Bay, were reported on by Jordan and Bollmann in the "Proceedings of the United States National Museum," 1889, pp. 149-183. A small portion of the collection, however, failed to reach the authors in time for their report, and has now been listed by Charles H. Gilbert, professor of geology in the University of Indiana. The supplementary list is noteworthy as containing the remarkable new genus *Dialommus* which repeats in the *Blenniidae* the peculiar structure of the eye seen in the Cyprinodont genus *Anableps*.